



CITY OF CARLISLE.

REPORT

ON THE

Sanitary Condition of the City of Carlisle,

FOR THE YEAR 1919,

BY

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CARLISLE:

CHAS. THURNAM & SONS, PRINTERS, 11 ENGLISH STREET.

TO THE CHAIRMAN AND MEMBERS OF THE HEALTH
COMMITTEE.

I have the honour to submit the following report on the health of the City during the year 1919.

POPULATION.

Census, 1911	... ..	46,432
As Extended, November 9th, 1912		52,225

Since 1914, owing to the absorption of practically the whole of the physically fit males into the Army, there has been some difficulty in estimating the population of the City. In 1916 and subsequent years an estimate of the population of the various districts in the country has been supplied by the Registrar-General. This figure is based on the assumption that the ratio between the total population and the civilian population is the same in each sanitary district as in England and Wales as a whole, and since the rationing of food-stuffs came into operation, the number of persons to whom ration cards have been issued has been used to check the figures so obtained.

The problem of arriving at an approximate estimate the population of the City of Carlisle has been further complicated by the influx of workers into the City, as a result of the establishment of a munition factory at Gretna. As the estimated population arrived at by the usual method, which is based upon the average rate of increase during the last intercensal period, the estimates supplied by the Registrar-General, the number of ration cards issued, and the figures obtained at the census of the City taken in 1917, show considerable discrepancies, I have set out the whole of these figures in the following table.

It will be observed from the table that the estimate of the civilian population supplied by the Registrar-General and the number of ration cards issued correspond fairly closely both for 1918 and 1919, and although they

are both considerably above the estimate arrived at, by assuming that the population has continued to increase at the same rate since the last census as during the intercensal period of 1901-1911, they probably are the nearest approximations to the correct figure, and ought to be accepted for statistical purposes until the next census of the population is enumerated.

		Population.			
		1916	1917	1918	1919
Estimated by usual method		52,719	52,813	52,907	53,001
Registrar- General's Estimate	Civilian Population ...	49,721	53,064	53,717	55,198
	Total Population ...	54,097	59,151	60,188	57,500
No. of Ration Cards Issued ... ..		...	...	54,263	55,737
Census of City 1917 ... ..		..	56,437	...	...

AREA IN ACRES—

Before Extension of the City Boundary, 1912	2,025
After Extension	4,488

DENSITY OF POPULATION—

No. of persons per acre (1912)	11.8
„ „ (1919)	12.3
No. of persons per house (census 1911) ...	4.4

Physical Features of the District.

Carlisle is situated on a low-lying plain, through which flows the River Eden, bounded on the north by the Bewcastle Fells and the hills of Dumfriesshire, on the east by the Pennines, and on the south by the Cumbrian Mountains, and open on its west side to the Solway Firth, into which the Eden flows.

The central portion of the City is built on a slight eminence of red sandstone, about 75 feet above ordnance datum. Two tributaries of the River Eden flow through the City from the south, the River Caldew on the west side of the central portion of the City, and the River Petteril on the east, to join the Eden within the City boundaries. The land in the neighbourhood of these two rivers is alluvial and low lying, the levels near the banks of the Caldew being about 40-60 feet, and, near the banks of the Petteril, 55-70 feet above ordnance datum. The level of water in these rivers and the Eden is from 30 to 55 feet above ordnance datum, with the result that the lower parts of the City have a high ground water level.

Between the centre of the City and the alluvial land in the neighbourhood of the River Petteril is a bed of clay. The outlying parts of the City, which are higher than the centre, rise gradually to a height of 100-125 feet, and are situate on beds of red sandstone.

The City is the terminus of seven railway companies, where the systems of the three principals railways of the south of Scotland connect with those of three important English railway companies; 13.1 per cent. of the male population of the City over the age of 10 years are employed by the various railway companies. In the City are established large engineering works, printing and lithographic works, textile, dyeing and bleaching works, biscuit and confectionery factories, carpet factories, felt hat works, breweries, and tanneries. An extensive trade is also carried on in cattle and timber. Female labour is largely employed in textile and carpet factories, biscuit and confectionery factories, and in printing and lithographic works.

The following tables set out the percentages and other particulars of males and females over the age of 10 years engaged in the various industries in the City at the census of 1911:—

MALES.

Unoccupied or Retired ... 17.3 per cent.

Employed—

Railways ...	13.1	„
Other forms of transport ...	5.5	„
Building and constructional work ...	9.7	„
Food, Tobacco, and Drink Trades ...	9.5	„
Textile Manufacture ...	5.1	„
Tailors, Drapers, Bootmakers, &c. ...	5.0	„
Professional and Local Govern- ment Work ...	5.0	„
Commerce ...	4.8	„
Printers, Lithographers, &c. ...	2.6	„
Miscellaneous occupations ...	22.4	„

82.7

FEMALES.

Retired or Unoccupied ... 64.1 per cent.

Employed—

Unmarried ...	30.4	„
Married ...	2.6	„
Widowed ...	2.9	„

Occupation of Females, 10 years and upwards :—

	Percentage of all females 10 years and upwards.	Percentage of employed females 10 years and upwards.
Domestic Service ...	6.5	18.2
Textile Manufacture ...	6.2	17.3
Dressmakers, Milliners, Drapers' Assis- tants, &c. ...	6.1	16.9
Food Workers ...	3.6	10.0
Food Dealers and General Shopkeepers ...	2.2	6.2
Nurses, Teachers, &c. ...	2.2	6.1
Engineering, Metal Working, &c. ...	1.8	5.0
Printing, &c. ...	1.4	3.9

BIRTHS.

The number of births registered during the year was 1,066, an increase of 33 over the figure for the previous year. 557 of the children born were males, and 509 females, the proportion of males to females being 1,094 to 1,000.

Calculated on the estimate of the total population supplied by the Registrar-General, viz., 57,500, the number of births per 1,000 of the population at all ages is 18.5, an increase of 1.4 per 1,000 upon the figure for the year 1918.

The birth-rate for the whole of England and Wales during 1919 was 18.5 per 1,000. The rate for the 96 great towns, to which classification Carlisle belongs, was 19.0 per 1,000, and for the 148 smaller towns of England and Wales, 18.3 per 1,000.

Year.	Number of Births Registered.			Per 1,000 of the population.
	Males.	Females.	Total.	
1910	589	556	1145	22.2
1911	563	546	1109	23.8
*1912	601	541	1142	24.6
1913	569	595	1164	22.1
1914	629	580	1209	23.0
1915	604	588	1192	22.6
1916	546	557	1103	20.3
1917	531	586	1117	18.8
1918	524	509	1033	17.1
1919	557	509	1066	18.5

* Old City.

The births and deaths registered during the year have been allocated to the various wards of the City, but as there

is at present no reliable information as to the population of the various wards, it is not possible to give the birth and death-rates for the various wards separately.

Table showing details of the Births in the several Wards, 1919.

QUARTER ENDING.	STANWIX AND ETTERBY.	RICKERGATE.	AGLONBY.	GREYSTONE.	ST. NICHOLAS.	CURROCK.	DENTON HOLME.	ST. CUTHBERT'S.	CALDEWGATE.	NEWTOWN AND BELLE VUE.	TOTALS FOR CITY.
March 31	17	26	16	28	31	24	22	22	36	12	234
June 30.....	14	20	21	38	32	26	32	31	36	20	270
September 30 ..	9	19	18	28	35	28	37	36	33	14	257
December 31.....	9	27	18	37	38	29	46	37	34	30	305
Totals... ..	49	92	73	131	136	107	137	126	139	76	1066

It will be observed that there was a marked increase in the number of births registered during the last quarter of the year. The total number of births registered during the year is, however, 100 less than the number notified to me in accordance with the provisions of the Notification of Births Act, as the births of a large number of children born during the last six weeks of the year had not been registered before December 31st.

ILLEGITIMATE BIRTHS.

The number of illegitimate births registered during 1919 was 94, making a figure equal to 88.1 per 1,000 of the total births.

The distribution of the illegitimate births among the several wards was as follows:—

	Stanwix and Etterby	Rickergate	Aglionby	Greystone	St. Nicholas	Curreck	Denton Holme	S. Cuthbert's	Caldewgate	Newtown & Belle Vue	Totals for City
Males	4	7	4	2	8	3	9	5	8	2	52
Females	...	9	3	5	3	2	4	5	7	4	42
Total	4	16	7	7	11	5	13	10	15	6	94

The number of illegitimate births registered shows an increase of 11 upon the figure for 1918, and an increase of 3 over the figure for 1917.

Upon investigation I find that in 8 instances, or 8.5 per cent. of the total illegitimate births for the year, the mother was not a resident of the City.

DEATHS.

The total number of deaths registered during 1919 was 778, as compared with 921 in 1918. 54 deaths occurred of persons belonging to the City in institutions and other places outside, while the deaths of 112 persons not belonging to the City occurred in public institutions and other places within the City.

Excluding the 112 deaths of persons belonging to outside districts, and substituting the 54 deaths of Carlisle residents occurring in other districts, a nett figure of 720 remains. This gives a nett death-rate of 13.6 per 1,000, or a standardised death-rate of 13.8 per 1,000 of the civil population at all ages, based upon the estimated civil population supplied by the Registrar-General for the purpose, viz., 55,198.

Table showing details of the corrected Deaths
in the several Wards, 1919.

Quarter Ending	Stanwix and Elderby	Rickergate	Aglionby	Greystone	St. Nicholas	Currock	Denton Holme	S. Cuthbert's	Caldewgate	Newtown & Belle Vue	Totals for City
March 31	13	16	26	19	21	21	20	30	39	31	236
June 30	10	27	19	19	17	6	23	19	8	26	174
September 30	10	7	15	16	12	11	20	15	9	9	124
December 31	7	28	26	23	17	17	31	13	17	7	186
Totals	40	78	86	77	67	55	94	77	73	73	720

Table showing the number of Deaths at all
Ages and at several Age periods.

	All Ages.	Under 1 Year.	1 and under 5	5 and under 15	15 and under 25	25 and under 65	65 and up- wards.
No. of Deaths at all ages at several age periods	720	115	50	22	26	244	263

The following is a list of the deaths of persons not belonging to the district occurring in public institutions and other places within the City:—

Cumberland Infirmary	...	...	...	62
Private Nursing Homes	...	...	...	23
Fever Hospital	...	...	...	5
Fusehill War Hospital	...	...	...	11
Private Houses	...	...	...	7
Harraby Hill House	...	...	...	1
Railway Station	...	...	...	2
River Petteril	...	...	...	1

The following table shows the diseases causing the largest number of Deaths during 1919, and a comparison with those of 1918.

DISEASE.	1918.	1919.	Increase or Decrease
Total Deaths	850	720	—130
Pulmonary Tuberculosis & Phthisis ...	48	46	— 2
Pneumonia	70	46	—24
Other Diseases of Respiratory System ...	63	57	— 6
Measles	6	11	+ 5
Influenza	107	38	—69
Whooping Cough	34	1	—33
Diphtheria, Membranous Croup ...	5	5	...
Diarrhoea and Enteritis	23	18	— 5
Rheumatic Fever, Chronic Rheumatism, Rheumatoid Arthritis	10	5	— 5
Cancer and Malignant Disease ...	66	49	—17
Disease of Heart and Blood Vessels ...	151	174	+ 23
Diseases of Digestive System other than Diarrhoea and Enteritis	30	16	—14
Diseases of Urinary System	38	24	—14
Diseases of Nervous System	32	31	— 1
Accidents due to Negligence ..	20	12	— 8
Prematurity, Injury at Birth, and Con- genital Deformity	28	32	+ 4
Debility, Atrophy, Inanition and Marasmus	12	25	+ 13
Old Age	46	69	+ 23

The following table sets out the Cause and the Ages at Death of 720 persons belonging to the City.

CAUSES OF DEATH.			NET DEATHS AT THE SUBJOINED AGES OF "RESIDENTS" WHETHER OCCURRING WITHIN OR WITHOUT THE DISTRICT.									TOTAL DEATHS WHETHER OF "RESIDENTS" OR "NON-RESI- DENTS" IN INSTITUTIONS IN THE DISTRICT.
			All Ages.	Under 1 year.	1 and under 2.	2 and under 5.	5 and under 15.	15 and under 25.	25 and under 45.	45 and under 65.	65 and up- wards	
1			2	3	4	5	6	7	8	9	10	11
All Causes	Certified	...	697	108	20	29	22	26	77	159	256	211
	Uncertified	...	23	7	1	..	...	...	1	7	7	...
Enteric Fever	...	...	...	...	...	...	...	...	...	...	...	...
Smallpox	...	...	...	...	...	...	...	...	...	...	...	...
Measles	...	...	11	4	1	4	2	...	...	...	...	3
Scarlet Fever	...	...	2	1	...	1	...	...	...	...	...	...
Whooping Cough	...	...	1	...	...	1	...	...	...	...	...	7
Diphtheria and Croup	...	...	5	...	1	1	2	...	1	...	...	7
Influenza	...	...	38	3	1	2	...	2	12	9	9	1
Erysipelas	...	...	1	...	...	...	...	...	...	...	...	4
Phthisis (Pulmonary Tuberculosis)	...	...	46	...	1	1	1	6	22	14	1	6
Tuberculous Meningitis	...	...	8	...	1	2	4	5	...	1	...	2
Other Tuberculous Diseases	...	...	8	...	...	2	...	...	2	28	19	32
Cancer, Malignant Disease	...	...	49	...	...	...	...	1	...	1	...	3
Rheumatic Fever	...	...	2	...	...	...	...	1	...	...	...	20
Meningitis	...	...	1	...	...	...	...	1	...	...	...	5
Organic Heart Disease	...	...	104	...	...	1	4	1	10	36	52	12
Bronchitis	...	...	45	7	3	..	1	...	4	7	23	6
Pneumonia (all forms)	...	...	46	15	8	3	...	1	2	8	9	1
Other Diseases of Respiratory Organs	...	...	12	...	...	4	...	...	2	6	...	1
Diarrhoea and Enteritis	...	...	18	14	1	1	1	...	...	...	1	2
Appendicitis and Typhlitis	...	...	1	...	...	...	...	1	...	...	...	...
Cirrhosis of Liver	...	...	1	...	...	...	...	...	...	...	1	...
Alcoholism	...	...	...	...	...	...	...	...	...	...	...	7
Nephritis and Bright's Disease	...	...	17	...	...	...	2	...	3	7	5	...
Puerperal Fever	...	...	...	...	...	...	...	...	...	...	...	...
Other Accidents and Diseases of Preg- nancy and Parturition	...	...	3	...	...	...	...	2	1	...	...	...
Congenital Debility & Malformation, including Premature Birth	...	...	59	57	1	1	...	...	...	...	...	5
Violent Deaths, excluding Suicide	...	...	12	...	1	3	1	1	...	3	3	10
Suicide	...	...	2	...	...	...	...	1	...	1	...	1
Other Defined Diseases	...	...	224	14	2	2	4	3	19	43	137	82
Diseases ill-defined or unknown	...	...	4	...	...	...	...	...	...	2	2	...
Totals			720	115	21	29	22	26	78	166	263	211
Sub- Entries included in above figures	Cerebro-spinal Meningitis	...	...	...	...	...	...	...	...	...	...	...
	Poliomyelitis	...	...	...	...	...	...	...	...	...	...	...
	Typhus Fever	...	...	...	...	...	...	...	...	...	...	2
	Lobar Pneumonia	...	5	...	1	...	...	...	1	2	1	10
	Pneumonia not defined	...	13	6	2	1	...	...	1	2	1	...

Table showing details of the Number and Nature of all Deaths of Persons belonging to the City during the year.

CAUSE OF DEATH.	AGES.											Totals.
	AGES.											
	0 to 1	1 to 2	2 to 5	5 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85		85 and upwards
I — GENERAL DISEASES.												
Measles (Morbilli) ...	4	1	4	2	...	...	...	...	...	...	...	11
Scarlet Fever ...	1	...	1	...	...	...	...	...	...	...	...	2
Influenza ..	3	1	2	...	2	5	7	5	4	7	2	38
Whooping Cough ...	...	...	1	...	...	...	...	...	...	...	...	1
Diphtheria, Membranous Croup ...	...	1	1	2	...	...	1	...	...	...	...	5
Epidemic Diarrhoea, Epid. (or Zym.) Enteritis ...	...	...	...	...	...	...	...	...	...	...	...	...
Diarrhoea (not otherwise defined) ...	...	1	...	...	...	...	...	...	...	...	...	1
Tetanus ...	7	...	...	1	...	...	...	...	...	...	...	8
Syphilis ...	2	...	1	...	...	...	1	...	...	...	...	1
Pneumonia { Lobar Broncho Not Defined	...	1	...	...	...	1	...	1	1	...	...	5
	9	5	2	...	1	...	...	2	2	6	1	28
Erysipelas ...	6	2	1	...	...	1	...	...	...	1	...	13
Septicæmia Sapræmia (not Puerperal) Pulmonary Tuberculosis (Tuberculous Phthisis) ...	...	...	...	1	6	9	12	6	2	1	...	39
Phthisis ...	...	...	...	...	...	1	...	2	4	...	...	7
Tuberculous Meningitis ...	...	1	2	4	1	...	...	...	...	...	...	8
Tuberculous Peritonitis ...	...	...	1	...	1	...	...	...	...	...	...	2
Tubercle of other Organs ...	...	...	1	...	4	...	...	1	...	...	...	6
Rheumatic Fever, Acute Rheumatism Chronic Rheumatism ...	...	...	...	...	1	...	...	...	...	...	...	2
Rheumatoid Arthritis, Rheumatic Gout Carcinoma ...	...	...	...	...	...	...	...	...	1	...	...	1
Cancer (Malignant Disease) not otherwise defined ...	...	...	...	...	...	2	...	4	10	11	1	29
Purpura ..	...	...	...	...	...	...	...	5	9	4	2	20
Anæmia, Leucocythæmia ...	...	...	1	1	...	...	3	...	...	...	...	1
Diabetes Mellitus ...	...	...	1	1	...	1	...	1	2	2	...	7
Premature Birth ...	21	...	...	...	...	...	...	...	...	...	...	21

CAUSE OF DEATH.	AGES.											TOTALS.
	upwards											
	0 to 1	1 to 2	2 to 5	5 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	
II.—LOCAL DISEASES — <i>continued.</i>												
<i>Gastro-Enteritis</i> ...	2	...	1	...	...	...	...	...	...	...	...	3
Appendicitis, Perityphlitis	...	...	...	...	1	...	...	...	...	...	...	1
Hernia ...	...	...	...	...	...	...	...	1	...	...	...	1
Intestinal Obstruction ...	1	...	...	...	...	...	...	...	...	...	...	1
Other Diseases of Intestine	...	...	...	...	...	...	...	...	...	...	...	1
Peritonitis (not Puerperal)	...	...	...	1	...	...	...	...	...	...	...	2
Cirrhosis of Liver	...	...	...	...	1	...	...	...	1	...	...	1
Liver and Gall Bladder, other diseases	...	...	...	...	1	...	...	...	...	...	...	2
<i>Lymphatic Diseases.</i>												
Thyroid, Body Disease ...	...	...	...	...	...	...	...	2	1	...	...	3
<i>Diseases of Urinary System.</i>												
Nephritis (Acute), Uræmia ...	...	...	...	2	...	2	2	3	2	1	...	12
Chronic Bright's Disease, Albuminuria	...	...	...	...	...	1	1	1	2	...	...	5
Bladder and Prostate Disease...	...	...	...	...	...	...	...	...	2	...	...	5
Urinary System, other Diseases	...	...	...	...	...	...	...	2	...	...	...	2
<i>Diseases of Generative System.</i>												
Other Diseases of Ovary	...	...	...	...	...	...	1	...	...	...	...	1
Other Diseases of Uterus and Vagina	...	...	...	...	...	...	1	...	...	...	...	1
<i>Accidents of Childbirth.</i>												
Puerperal Convulsions ...	...	...	...	...	...	...	...	...	...	...	...	1
Other Accidents of Pregnancy and Childbirth ...	...	...	...	...	1	1	...	...	...	...	...	2
III.—DEATHS FROM VIOLENCE.												
<i>Accident or Negligence.</i>												
Fractures and Contusions	...	...	...	...	...	...	...	...	...	1	...	1
Burn, Scald	...	...	2	...	...	...	...	...	1	...	...	4
Drowning	...	...	...	1	...	...	...	...	...	...	...	1
Otherwise	...	1	1	...	1	...	1	2	...	...	...	6
<i>Suicide.</i>												
Cut, Stab	...	...	...	...	...	...	...	1	...	...	...	1
Hanging	...	...	...	...	1	...	...	...	...	...	...	1
IV.—DEATHS FROM ILL-DEFINED AND NOT SPECIFIED CAUSES.												
Old Age ...	...	...	...	...	...	...	...	...	...	...	...	69
Debility, Atrophy, Inanition, Marasmus	24	1	...	...	...	...	...	...	19	38	12	25
Hæmorrhage	...	...	...	...	...	...	...	...	...	...	...	1
Causes not specified or Ill-defined	...	...	...	...	...	...	1	1	1	...	...	3

The following table shows the Vital Statistics for the whole City during 1919 and previous years.

YEAR.	Population estimated to Middle of each Year	BIRTHS.			TOTAL DEATHS REGISTERED IN THE DISTRICT.		TRANSFERABLE DEATHS.		NETT DEATHS BELONGING TO THE DISTRICT.			
		Uncorrected Number.	Nett.		Number.	Rate.	of Non-residents registered in the District.	of Residents not registered in the District.	Under 1 Year of age		AT ALL AGES.	
			Number.	Rate.					Number.	Rate per 1,000 Nett Births.	Number.	Rate.
1	2	3	4	5	6	7	8	9	10	11	12	13
1912	52,225	1149	1149	20.2	823	15.7	63	23	120	104.4	783	14.0
1913	52,497	1164	1164	22.1	821	15.6	76	24	148	127.1	769	14.6
1914	52,530	1209	1209	23.0	848	16.1	69	22	148	122.4	801	15.2
+1915 {	52,625 50,036	1192	1192	22.6	994	18.8	72	31	172	144.3	953	18.1
+1916 {	49,721 54,097	1103	1103	20.3	850	17.0	93	24	112	101.3	781	15.7
+1917 {	59,151 53,064	1117	1120	18.9	826	15.5	101	46	119	106.5	771	14.5
+1918 {	60,188 53,717	1033	1037	17.2	921	17.1	120	49	131	126.8	850	15.8
+1919 {	57,500 55,198	1066	1078	18.7	778	14.1	112	54	115	107.9	720	13.6

+ Registrar-General's estimates of population.

The following public and other Institutions are within the City:—

The Union Workhouse and its Infirmary.
The Cumberland Infirmary.
Carlisle Non-Provident Dispensary.
The Crozier Lodge Isolation Hospital.
Strathclyde House (Home for Incurables).
St. Joseph's Home (aged and infirm persons).
Chadwick Memorial (Industrial School).
Corporation Dispensary and School Clinic.

Birth-rate, Death-rate, and Infantile Mortality in Carlisle since 1891.

Year.	No. of Births.	Birth- rate.	No. of Deaths.	Gross Death- rate.	Infantile Mor- tality.	Average Five Years.		
						Birth- rate.	Death- rate.	Infant Mortality.
1891	1207	30.8	789	20.1	137	31.8	20.1	142.6
1892	1213	30.5	805	20.2	123			
1893	1389	34.5	868	21.6	178			
1894	1315	32.0	780	19.2	133			
1895	1311	31.4	794	19.4	142			
1896	1246	29.6	753	18.2	137	29.9	19.5	146.6
1897	1324	30.8	811	19.4	134			
1898	1311	30.0	935	22.2	183			
1899	1300	29.4	818	19.2	145			
1900	1354	30.1	807	18.8	134			
1901	1246	27.3	810	17.8	129	26.7	17.9	131.0
1902	1245	27.0	856	18.5	117			
1903	1322	28.4	813	17.4	118			
1904	1278	26.7	933	19.7	152			
1905	1168	24.3	783	16.3	139			
1906	1227	25.3	811	16.7	132	23.6	15.1	127.5
1907	1178	23.8	848	17.1	143			
1908	1223	24.4	713	14.2	129			
1909	1149	22.6	735	14.5	123.6			
1910	1145	22.2	683	13.2	110.0			
1911	1109	23.8	776	16.7	145.0	23.2	17.1	128.2
1912	1142	24.6	813	17.5	102.4			
1913	1164	22.1	821	15.6	127.1			
1914	1209	23.0	848	16.1	122.4			
1915	1192	22.6	1027	19.5	144.3			
1916	1103	20.3	850	17.0	101.5			
1917	1117	18.8	826	15.5	106.5			
1918	1033	17.1	921	17.1	126.8			
1919	1066	18.5	778	14.1	107.9			

Birth-rate, Death-rate, and Analysis of Mortality during the Year 1919.

(Populations estimated to the middle of 1919 have been used for the purposes of this Table.)

	BIRTH-RATE PER 1,000 TOTAL POPULATION.	ANNUAL DEATH-RATE PER 1,000 CIVILIAN POPULATION.*								RATE PER 1,000 BIRTHS.		PERCENTAGE OF TOTAL DEATHS.*			
		All Causes.	Enteric Fever.	Smallpox.	Measles.	Scarlet Fever	Whooping Cough	Diphtheria.	Violence.	Diarrhoea and Enteritis (under 2 years).	Total Deaths under One Year.	Deaths in Public Institutions.	Certified Causes.	Inquest Cases.	Uncertified Causes of Death.
England and Wales*	18.5	13.8	0.01	0.00	0.10	0.03	0.07	0.13	0.47	9.59	89	23.9	92.5	6.2	1.3
96 Great Towns, including London (Census Populations exceeding 50,000)	19.0	13.8	0.01	0.00	0.13	0.04	0.07	0.14	0.45	12.24	93	29.3	92.3	6.9	0.8
148 Smaller Towns (Census Populations 20,000—50,000)	18.3	12.6	0.01	0.00	0.10	0.03	0.08	0.12	0.39	8.67	90	16.6	93.6	4.9	1.5
London ...	18.3	13.4	0.01	0.00	0.08	0.03	0.05	0.18	0.47	16.22	85	44.7	91.2	8.6	6.2
Carlisle†	18.5	13.3	0.00	0.00	0.21	0.04	0.02	0.09	0.27	14.07	103	15.1	94.0	2.3	3.2

* Non-civilians are included in these figures for England and Wales but not for other areas.
 † Population estimated by the Registrar General—
 For Birth-rate 57,500 } 1919
 And for Civilian Death-rate 55,198 }

INQUESTS.

During the year the City Coroner held 32 inquests.

Of this number 20 were held upon the bodies of persons who had been resident within the City, and 12 upon the bodies of persons who resided in other districts but who died within the City.

7 related to children under 5 years of age, and in 2 instances the infant was under 1 year.

The verdict of the Jury and the ages in the 7 cases respectively. were :—

Cause.	Age.
Accidentally asphyxiated	5 minutes
Natural causes, viz., Convulsions	4 months
Accidentally killed by falling downstairs ...	23 months
Accidentally killed by falling downstairs ...	3 yrs. 2 mths.
Septic poisoning, the result of scalds accidentally received	2 yrs. 3 mths.
Accidentally killed by being knocked down by a milk float	2 yrs. 11 mths.
Shock, the result of burns accidentally received ...	3 yrs. 3 mths.

MORTUARY.

During 1919 10 bodies were removed to the Public Mortuary, a post-mortem examination being performed in each instance.

UNCERTIFIED DEATHS.

During the year 23 deaths were registered of persons belonging to the City in which no certificate was given by a medical man, and in which no inquest was held.

During 1918 31 such deaths were registered.

The 23 deaths in question were registered as being due to the following causes :—

	Sex.	Age.	Cause of Death as Registered.
1	Male	*1 day	Convulsions
2	Male	*3 months	Convulsions
3	Male	*3 months	Convulsions
4	Female	*6 months	Convulsions
5	Male	*4 months	Pneumonia and Convulsions
6	Male	*11 days	Pneumonia
7	Female	*5 months	Malformation of the Chest
8	Male	20 months	Bronchitis
9	Male	47 years	Tuberculosis
10	Male	54 years	Heart Failure
11	Female	59 years	Heart Failure
12	Female	69 years	Heart Failure
13	Male	70 years	Heart Failure
14	Female	72 years	Heart Failure
15	Female	74 years	Heart Failure
16	Male	84 years	Heart Failure
17	Male	58 years	Syncope
18	Male	66 years	Syncope
19	Male	61 years	Heart Disease
20	Male	62 years	Apoplexy
21	Male	62 years	Apoplexy
22	Male	76 years	Paralysis
23	Female	43 years	Epilepsy

*It will be observed that seven of the deaths were infants under one year of age.

CANCER.

The following figures include all deaths from causes coming within the general term cancer. The number of deaths registered during 1919 was 49, as against 66 in the year 1918.

Calculating the 49 cases upon the Registrar-General's figure of 55,198, a mortality rate of 0.9 per 1,000 at all ages is obtained.

Table of Deaths from Cancer, 1910 to 1919.

Age.	Numbers.									
	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
1 to 5 years ...	...	1	...	1	...	...	...	...	...	...
5 to 15 years ...	...	2	...	1	...	...	...	...	1	...
15 to 25 years ...	1	2	3	...	...	1	1	1	1	...
25 to 35 years ...	...	5	2	1	2	...	2	1	1	2
35 to 45 years ...	7	5	6	5	10	3	6	7	5	...
45 to 55 years .	11	6	18	11	10	7	17	10	13	9
55 to 65 years ...	11	11	18	25	20	21	21	32	21	19
65 to 75 years ...	11	7	10	14	16	20	18	14	17	15
75 and upwards	6	6	5	5	10	6	9	8	7	4
Totals ...	47	45	62	63	68	58	74	73	66	49

INFECTIOUS DISEASES.

With the exception of measles the City has been comparatively free from infectious diseases during the year. The total number of notifications relating to cases of infectious diseases received during the year was 1,755.

Measles	...	...	...	...	1,307
Pulmonary Tuberculosis			...	...	102
Erysipelas	...	...	...	...	63
Acute Influenzal Pneumonia			...	...	58
Diphtheria	...	...	...	...	51
Scarlet Fever	...	...	...	...	41
Ophthalmia Neonatorum			...	...	34
Malaria	...	...	...	...	31
Acute Primary Pneumonia			...	...	29
Non-Pulmonary Tuberculosis			...	...	25
German Measles	...	...	...	...	5
Dysentery	...	...	...	...	3
Encephalitis Lethargica			...	...	2
Acute Poliomyelitis	...	...	...	...	2
Enteric Fever	...	...	...	...	1
Puerperal Fever...	...	...	...	...	1
					<hr/>
					1,755
					<hr/>

During the year 91 deaths of residents in the City were registered as being due to infectious diseases, viz.:—

Pulmonary Tuberculosis	...	...	...	...	46
Non-Pulmonary Tuberculosis			...	...	16
Measles	...	...	...	...	11
Diarrhœa	...	...	...	...	9
Diphtheria	...	...	...	...	5
Scarlet Fever	...	...	...	...	2
Whooping Cough	...	...	...	...	1
Erysipelas	...	...	...	...	1
					<hr/>
					91
					<hr/>

The number of deaths certified as due to the seven principal zymotic diseases was 17, equal to a zymotic death-rate of 0.3 per 1,000 of the estimated population of the City. In the previous year 72 deaths were due to zymotic diseases, equivalent to a zymotic death-rate of 1.3 per 1,000.

Table showing the Age and Seasonal Incidence of the various Infectious Diseases notified during 1919.

	Number of Cases Notified at various Ages.						Number of Cases notified in each Month.												Total number of cases notified	Number of cases in- correctly notified	Nett number of cases notified	Number of cases removed to hospital	
	Under 1 year	1—5 years	5—15 years	15—25 years	25—45 years	45—65 years	65 and up-wards	January	February	March	April	May	June	July	August	September	October	November					December
Scarlet Fever	2	9	23	4	3	..	..	.. 9	.. 8	4 5	4 4	3 1	3 7	1 4	1 1	4 2	7 3	7 3	7 3	41	.. 4	41	25
Diphtheria ...	..	13	20	10	7	..	..	1 1	..	5	4	1	7	4	1	2	3	4	4	51	.. 1	47	34
Enteric Fever	..	..	1	..	..	..	..	.. 1	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Puerperal Fever	..	..	..	1	..	..	..	.. 4	.. 2	2	5	2	1	3	4	12	7	..	13	..	..	..
Erysipelas ...	2	1	6	8	24	16	6	.. 4	..	..	..	..	1	10	10	117	461	227	478	63	..	63	4
Measles ...	56	646	587	9	9	..	..	1	..	..	2	1	1	1	4	..	3	..	..	1307	1	1306	24
German Measles	..	..	3	2	23	..	..	..	..	3	..	3	4	3	4	..	3	..	..	5	..	5	..
Malaria	..	..	..	7	..	1	..	..	..	..	..	..	4	3	1	1	1	..	..	31	..	31	..
Dysentery ...	..	..	..	..	3	..	..	..	..	..	..	..	7	8	..	4	1	..	..	3	..	3	..
Acute Primary Pneumonia	..	8	9	5	5	2	..	..	..	4	1	2	..	..	..	4	..	2	..	28	1	28	..
Acute Influenzal Pneumonia	2	8	9	7	19	7	5	..	..	41	9	4	..	..	..	..	..	..	..	58	..	58	10
Encephalitis Lethargica	..	..	2	1	1	..	..	..	..	..	..	..	1	..	..	..	..	1	..	2	1	1	..
Polio-myelitis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	34	..	34	..
Ophthalmia Neonatorum	34	..	..	..	..	..	..	3	1	1	1	2	3	2	1	8	6	2	..	102	..	102	..
Pulmonary Tuberculosis	1	3	21	24	40	11	2	10	4	11	13	18	7	13	3	3	8	2	2	102	..	102	..
Other forms of Tuberculosis	1	6	11	3	4	..	..	2	..	1	5	8	4	1	3	1	..	..	..	25	..	25	..

Table showing the number of Cases of, and Deaths from, Notifiable Infectious Diseases occurring in the various Wards of the City, 1919.

	Stanwix		Ricker- gate		Aglionby		Grey- stone		St. Nicholas		Currock		Denton Holme.		St. Cuthberts		Caldew- gate		Newtown and Belle Vue		Carlisle	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Scarlet Fever	8	..	4	..	2	..	7	..	3	..	1	..	1	..	3	..	3	..	9	2	41	2
Diphtheria	..	..	1	..	7	..	5	..	6	..	10	..	5	..	..	..	7	1	10	..	51	5
Enteric Fever	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Puerperal Fever	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Erysipelas	2	..	7	..	4	..	6	..	6	..	5	..	8	..	2	..	10	..	13	..	63	1
Measles	62	..	97	2	103	1	125	..	162	3	247	1	144	1	121	1	171	1	75	2	1307	12
German Measles	1	..	1	..	..	..	2	..	1	..	..	..	8	..	..	..	5	..	..	..	5	..
Malaria	..	..	4	..	1	..	3	..	2	..	2	..	..	..	4	..	..	..	2	..	31	..
Dysentery	1	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	3	..
Acute Primary Pneumonia	..	..	4	..	1	..	..	..	4	..	1	..	6	..	4	..	7	1	2	..	29	1
Acute Influenzal Pneumonia	2	..	4	1	3	1	7	2	11	6	2	..	8	2	8	..	6	1	7	1	58	14
Encephalitis Lethargica	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	2	..
Poliomyelitis	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	2	..	..
Ophthalmia Neonatorum	..	..	..	..	..	..	3	..	4	..	1	..	4	..	8	..	8	..	6	..	34	..
Pulmonary Tuberculosis	7	2	6	4	10	6	11	4	11	3	10	7	20	8	10	8	10	3	7	1	102	46
Other forms of Tuberculosis	..	..	3	1	..	..	7	4	4	1	2	2	6	2	1	2	2	1	..	1	25	16

Table showing the number of Cases of Notifiable Diseases recorded in the City,
and the number of deaths from each during the past 7 years.

	1913		1914		1915		1916		1917		1918		1919	
	No cases Notified	Deaths	No cases Notified	Deaths	No cases Notified	Deaths	No Cases Notified	Deaths	No cases Notified	Deaths	No cases Notified	Deaths	No cases Notified	Deaths
Smallpox .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scarlet Fever	159	...	250	9	562	10	225	6	30	3	38	...	41	2
Diphtheria	52	9	44	3	68	12	153	28	98	13	62	6	51	5
Enteric Fever	5	...	2	...	1	...	3	...	1	1	1	...	1	...
Typhus Fever .....	...	...	...	...	...	...	1	1	...	...	1	...	...	...
Continued Fever .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Puerperal Fever	1	1	1	...	...	...	4	2	1	1	...	...	...	...
Erysipelas.....	51	3	57	...	72	...	45	1	64	1	38	1	63	1
Measles.....	*	...	*	2	*	35	60	1	1796	12	420	6	1307	11
German Measles	*	...	*	...	*	...	22	...	404	6	...	...	5	...
Cerebro-Spinal Fever...	*	...	*	...	*	...	...	...	3	2	1	1	...	...
Polomyelitis	3	1	2	...	3	1	3	...	1	...	...	...	2	...
Encephalitis Lethargica	*	...	*	...	*	...	*	...	*	...	*	...	2	...
Malaria	*	...	*	...	*	...	*	...	*	...	*	...	31	...
Dysentery	*	...	*	...	*	...	*	...	*	...	*	...	3	...
Acute Primary Pneumonia	*	...	*	...	*	...	*	...	*	...	*	...	29	...
Acute Influenzal Pneumonia	*	...	*	...	*	...	*	...	*	...	*	...	58	10
Ophthalmia Neonatorum	*	...	20	...	10	...	8	...	17	...	21	...	34	...
Pulmonary Tuberculosis	351	71	231	70	194	80	167	66	103	72	109	48	102	46
Other forms of Tuberculosis	96	25	56	32	56	26	49	29	30	24	28	19	25	16

* Indicates that the disease was not notifiable during the year.

SCARLET FEVER.

For the third year in succession the City has been fortunate in having an extremely low incidence of this disease, five years having passed since the last extensive epidemic of scarlet fever occurred, with the result that there is now a large population of young children susceptible to the disease, among whom it is liable to spread very rapidly should an epidemic occur.

During the year 41 cases of scarlet fever were notified, an increase of 3 on the number notified during the previous year, 21 of the cases occurring during the last quarter. The cases occurred in all parts of the City, and there was no evidence of localised spread of infection. 4 cases occurred in the Cumberland Infirmary during the months of October and November.

25 persons, or 61 per cent., suffering from the disease were removed to the isolation hospital.

Table showing the number of notifications, number of cases isolated, number and percentage of deaths from scarlet fever during the years 1910-19.

Year.	No. of cases notified.	No. of cases isolated in Hospital.	Average period in Hospital (days).	No. of return cases.	No. of deaths.	Deaths per 100 cases.
1910	248	171	42.0	7	2	0.7
1911	139	104	42.8	3	2	1.4
1912	110	101	42.3	2	2	1.8
1913	164	131	44.2	4	0	0.0
1914	251	196	51.1	10	9	3.6
1915	562	273	37.8	27	10	1.7
1916	225	117	45.6	6	6	2.6
1917	30	19	43.0	0	0	0.0
1918	33	30	39.8	0	0	0.0
1919	41	25	34.3	0	2	4.9

2 deaths of residents in the City were due to this disease; in both cases the deaths occurred in the isolation hospital, the patients being transferred there from the Cumberland Infirmary.

Return Cases.

No return case occurred during the year.

DIPHTHERIA.

(Including Membranous Croup.)

The number of cases of diphtheria notified during 1919 was 51, as against 62 in 1918. 4 cases notified were subsequently found not to be suffering from diphtheria.

Towards the end of 1918, 10 cases occurred in Currock Ward, chiefly in houses in the neighbourhood of Harrison Street. 8 further cases occurred in that district during January and February of last year, and were all probably attributable to the same source of infection. 10 cases of the disease occurred in Newtown Ward, 5 being in-patients at the Cumberland Infirmary at the time of notification, of whom only 1 was a resident of Carlisle. 1 case was notified from the isolation hospital.

During the year 5 deaths of residents were registered as being due to diphtheria, and 1 patient from another area, who was notified from the Infirmary, also died, the death-rate being .09 per 1,000 of the estimated population. The case mortality was 9.8.

34, or 66 per cent., of the cases notified were removed to the isolation hospital.

No return case occurred during the year.

ANTI-DIPHTHERIA SERUM.

12 applications were made by medical practitioners for the free supply of anti-diphtheria serum, 58,000 units being supplied.

Table showing number of notifications, number of cases isolated, number and percentage of deaths, 1902-1919.

Year.	No. of cases notified.	No. of cases isolated in Hospital.	No. of deaths.	Deaths per 100 cases.
1902	156	81	41	26.2
1903	68	46	20	29.4
1904	39	25	14	35.8
1905	25	14	6	24.0
1906	20	8	5	25.0
1907	12	6	3	25.0
1908	31	20	4	12.7
1909	36	18	4	11.1
1910	37	27	2	5.4
1911	44	33	4	9.1
1912	47	33	6	12.8
1913	57	42	9	15.8
1914	52	31	3	5.8
1915	73	51	12	16.4
1916	153	118	28	18.3
1917	98	81	12	12.2
1918	62	51	6	9.6
1919	51	34	5	9.8

SMALLPOX.

The district was free from smallpox during the year.

17 notifications were received from the Ministry of Health and other Local Authorities that persons who had been in contact with smallpox were proceeding to Carlisle. All the persons referred to in these notices were visited and kept under observation.

ENTERIC FEVER.

The City was free from enteric fever during the year.

1 person, a girl aged 6 years, was notified as suffering from this disease, but it was subsequently ascertained that the diagnosis was incorrect.

Table showing the average number of cases notified as enteric fever for 5-year periods, 1890-1914, and for the 5 years 1915-1919.

Years.	Average for periods of 5 years.	Year.	Number of cases notified.
1890-1894	21·2	1915	2
1895-1899	18·6	1916	3
1900-1904	12·6	1917	0
1905-1909	3·2	1918	1
1910-1914	3·8	1919	1

No case of typhus or continued fever was notified during the year.

Public Health (Pneumonia, Malaria, and Dysentery, &c.) Regulations, 1919.

Under the above regulations, which came into operation on the first day of March, 1919, it is the duty of a medical practitioner to make and send to the Medical Officer of Health a notification as soon as he becomes aware that a person upon whom he is in attendance is suffering from malaria, dysentery, trench fever, acute primary pneumonia, or acute influenzal pneumonia.

During the year 121 notifications were received in accordance with these regulations.

MALARIA.

31 notifications relating to patients suffering from malaria were received. In all the cases the patients had recently returned to this country after being on active service in the Balkans, Egypt, or Mesopotamia, where they had been infected with the disease. No case of malaria of indigenous origin was notified, nor was it anticipated that a local spread of this disease would occur, as the particular species of mosquito responsible for the spread of malaria, so far as I am able to ascertain, does not exist in the district.

DYSENTERY.

3 persons were notified as suffering from dysentery. In each case the patient had suffered from dysentery while on active service in the Near East, and were suffering from a relapse of the condition at the time of notification. The cases were kept under observation and precautions against spread of infection were taken. No extension of the disease occurred.

PNEUMONIA.

87 notifications of cases of pneumonia were received, in 58 of which the person was stated to be suffering from acute influenzal pneumonia, and 29 acute primary pneumonia. The notifications relating to acute influenzal pneumonia, with the exception of 4 in December, were received during the first three months the regulations were in force, a period which marked the decline of the epidemic of influenza which commenced during the previous year.

The maximum incidence of acute primary pneumonia occurred during June and July, when 7 and 8 cases respectively were notified.

All the cases were visited by the Corporation Health Visitors, and advice as to the nursing and prevention of the spread of infection, &c., was given.

174 such visits were made by Health Visitors in this connection, and 10 patients who could not with safety be nursed at home were removed to the isolation hospital.

14 persons notified as suffering from acute influenzal pneumonia died, and 1 person notified as suffering from acute primary pneumonia died six weeks later, the cause of death being certified as pulmonary tuberculosis.

INFLUENZA.

The epidemic of influenza which affected the City in 1918 attained its maximum intensity in November and December of that year, and then rapidly declined. It was not possible to obtain any definite information as to the number of cases of the disease, but the notification of acute influenzal pneumonia which came into force on March 1st showed that the epidemic had not entirely died out by that date, as 41 cases of influenzal pneumonia were notified in March, 9 in April, and 4 in May, after which month no further notifications were received until December.

The prevalence of influenza throughout this country had declined to such an extent that the Public Health (Influenza) Regulations (No. 1 and No. 2), which related to the regulation of public entertainments and cinematograph exhibitions, were rescinded on May 6th.

42 deaths were certified as due to influenza, 4 of the deaths being persons not residents of the City. The age distribution of the deaths occurring among the 38 persons resident in the City was as follows:—

0 to 1	1 to 2	2 to 5	5 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards	Total
3	1	2	...	2	5	7	5	4	7	2	...	38

CEREBRO-SPINAL FEVER.

No case of cerebro-spinal fever was notified during the year.

The Public Health (Cerebro-Spinal Fever) Regulations, 1919, were issued by the Local Government Board in June, cancelling the previous regulations, and giving powers to County Councils and the Councils of County Boroughs to provide for the examination and treatment of any person who is either suspected to be suffering from cerebro-spinal fever or has been in contact with a person suffering from or suspected to be suffering from the disease, and also to provide serum and other aids in the treatment of cases.

TETANUS.

The Minister of Health notified all Local Authorities that a stock of tetanus antitoxin, surplus to army medical requirements, had been placed at his disposal by the Army Council, and requested the Local Authority to make application for a supply of the same.

An application was made and a supply of the antitoxin obtained for the use of medical practitioners in connection with the prophylaxis and treatment of cases of tetanus occurring in the City.

ENCEPHALITIS LETHARGICA.

2 notifications relating to this disease were received. The first, which was received in June, related to a man aged 34, who had been engaged up to the time of his illness on a farm outside the City. The friends of the patient obtained his admission to the Cumberland Infirmary, where after a long period of unconsciousness he recovered, but with total blindness.

The second notification was received in December, and the patient died, but the condition was found before death to be pneumococcal meningitis and not encephalitis lethargica.

ANTHRAX.

In November, information was received from Dr. Hope, Medical Officer of Health of Liverpool, that a parcel of shaving brushes, part of a consignment of these articles from the East which had been found to be infected with anthrax, had been sold to a trader in Carlisle. Inquiries were made at the establishment of the firm in

question, and it was ascertained that 3 of the brushes had already been sold by retail and could not be traced. The remaining 9 were given up by the head of the firm, after which they were condemned.

The 9 brushes were submitted to Professor Delepine for bacteriological examination, and in due course a report was received, of which the following is an extract:—

“The result of the examination of the brushes shows that the three brushes tested were infected, two of them with anthrax bacilli, the third with the bacillus of malignant œdema (*vibrio septicus*); the last was probably infected with anthrax also, but the animals were killed by the septic vibrio.”

ISOLATION HOSPITAL.

There are two hospitals for the isolation of cases of infectious disease in the City, viz.:—

Crozier Lodge, Newtown—Total available beds, 50.

Smallpox, Belle Vue—Total available beds, 12.

5 types of infectious disease can be treated concurrently.

Table showing the number of cases removed to the Isolation Hospital.

Disease.			No. of cases admitted	Recovered.	Died.
Diphtheria	...	...	34	30	4
Scarlet Fever	...	...	25	23	2
Measles	...	...	24	24	...
Pneumonia	...	...	10	8	2
Erysipelas	...	...	4	4	...
Totals	...	...	97	89	8

Table showing case mortality of Scarlet Fever and Diphtheria isolated in Hospital compared with Home Cases.

Year.	SCARLET FEVER.				DIPHTHERIA.			
	Hospital Cases.		Home Cases.		Hospital Cases.		Home Cases.	
	No. of Cases Isolated.	Death-rate per 100	No. of Cases Isolated.	Death-rate per 100	No. of Cases Isolated.	Death-rate per 100	No. of Cases Isolated.	Death-rate per 100
1911	104	0·9	35	2·8	33	3·0	11	27·2
1912	101	1·8	9	0·0	33	6·0	14	28·5
1913	131	0·0	33	0·0	42	11·9	15	26·6
1914	196	4·6	55	0·0	31	9·6	21	0·0
1915	273	2·2	297	1·3	51	15·6	22	18·1
1916	117	4·2	108	0·9	118	22·0	35	5·7
1917	19	0·0	11	0·0	81	11·1	17	17·6
1918	30	0·0	8	0·0	51	6·0	11	18·2
1919	25	8·0	16	0·0	34	11·7	17	5·9

NOTIFICATION FEES.

The total amount paid in fees for notification of all notifiable diseases during 1919 was £63 7s. 9d.

BACTERIOLOGICAL WORK.

The examination of sputum for the presence of tubercle bacilli is carried out by Dr. Spence. During the past year 51 specimens have been examined, in 20 of which tubercle bacilli were found.

3 swabs from throats were sent by medical practitioners to the Clinical Research Association for examination for the Kleb's Loeffler bacillus, but in only 1 instance was the organism found.

During the year 20 samples of milk were purchased for the purpose of bacteriological examination from carts of persons selling milk within the City, whose dairies are situated outside the City boundary. The samples were submitted to Professor Delepine at the Public Health Laboratory, who reported that in one instance tubercle bacilli were present, while in three instances, as the animals died within 10 days of inoculation, it was not possible to say definitely that no tubercle bacilli were present. In the remaining 16 samples tubercle bacilli were not found.

4 samples of milk from cows found to be suffering from disease of the udder by the Veterinary Inspector were sent to the Clinical Research Association for examination, but in all four instances neither microscopical examination nor animal inoculation revealed the presence of tubercle bacilli.

Four samples of the City water supply, drawn from a domestic tap, were sent to Professor Delepine for bacteriological examination. A tabulated summary of Professor Delepine's report and his observations are given on page 87.

9 shaving brushes were submitted to Professor Delepine for examination for the presence of anthrax bacilli. ^{see} These brushes were taken indiscriminately and tested by inoculation into guinea pigs; in two instances the animals died of anthrax in three and four days respectively, while the third animal died on the second day of malignant oedema. The animal was probably also infected with anthrax.

170 specimens in connection with cases of venereal diseases were submitted to Professor Henry R. Dean of the Department of Pathology, University of Manchester,

138 being submitted for the Wassermann reaction, 8 for examination for the presence of spirochaetae, and 24 for gonococci.

Summary of the Examinations of Specimens in connection with Venereal Diseases.

Professor H. R. DEAN.

County or Borough in which patients reside.	Treatment centre or practitioner.	Total number of Specimens.	SYPHILIS.				GONORRHOEA.	
			Wassermann Reaction		Spirochaetae.		Gonococcus.	
			No.	+	No.	+	No.	+
Carlisle ...	Cumberland Infirmary	136	112	59	6	4	18	6
	Private Practitioners	17	16	11	...	...	1	1
Cumberland ...	Cumberland Infirmary	13	6	3	2	1	5	...
Westmorland ...	do.	1	1	...	...	...	...	...
Dumfriesshire ..	do.	2	2	2	...	...	...	...
Annan ...	do.	1	1	...	...	...	...	...
	Totals	170	138	75	8	5	24	7

Summary of Bacteriological Examination.

Sputum for tubercle bacillus	...	...	51
Milk for tubercle bacillus	...	...	21 4
Swabs for Klebs Loeffler bacillus	...	...	3
Shaving brushes for anthrax bacillus	...	...	3
Water for general bacteriological examination			4
Blood for Wassermann reaction	...	...	138
Serum for spirochaetae	...	...	8
Pus for gonococci	...	...	24
			—
Total	...	...	252 5
			—

Annual Return from the Public Health Laboratory, Manchester, upon Bacteriological Examination made during the year, 1919.

Professor DELEPINE.

A.	MONTH.	Bovine Tuberculosis Milk.		WATER.
		Total.	+	Bacteriological.
				Total
January	4	1	...
February...
March	4	...	1
April
May
June	1
July	8	...	1
August
September
October	1
November	...	4	...	..
December
		20	...	4

Various Investigations.

B.	Date.	Refer. No.	Nature,	No. of Samples. **
December, 1919	L.B. 11692.	Shaving brushes.	3

Total Number of Specimens in List **A.**—24.

Total Number of Specimens in List **B.**—3.

**Grand Total of Specimens received—27.

TUBERCULOSIS.

The scheme for the treatment of tuberculosis in the City of Carlisle is modelled on that recommended in the report of the Royal Commission on Tuberculosis, the central unit of the scheme being the Tuberculosis Dispensary, established in 1914, where all cases of tuberculosis are examined, and from which the home treatment of the disease is supervised. The Corporation possesses no sanatorium of its own, but 20 beds were provided at Blencathra Sanatorium in 1915, and this accommodation, which is on the scale of one bed for each 2,500 of the population, is found to be quite adequate for the treatment of early cases of tuberculosis. These are the only two units of the scheme at present in operation. It is earnestly hoped, however, that the City will as speedily as possible provide a hospital for the treatment of those tuberculous patients who are unsuitable for sanatorium treatment, and also for the isolation of advanced cases. After-care Committees have been recommended as a valuable part of the scheme for assisting tuberculous patients, but with the activities of Dr. Spence, who is responsible for this work, experience has shown that at present there is no real need to set up a special committee of this kind, as it is usually possible to obtain assistance for any persons requiring it.

The work in connection with the treatment of tuberculosis is carried out by the Assistant Medical Officer of Health, who is also Tuberculosis Officer, and the nurses, who combine the duties of School and Tuberculosis Nurses, under the control and supervision of the Medical Officer of Health. The employment of a single staff for these combined duties ensures close co-ordination of the work, saving of time and unnecessary duplication of enquiries. The home is visited by a nurse as soon as possible after the receipt of a notification, for the purpose of making a preliminary investigation into the home conditions and surroundings of the patient. Advice as to general and

personal hygiene is given, emphasis being laid on the necessity of good food, adequate ventilation and general cleanliness of the room occupied by the patient.

If the patient is able to visit the Tuberculosis Dispensary an appointment is made for him to attend for examination by the Tuberculosis Officer, but if unable he is examined at home. At the time of examination careful instructions as to the mode of life, the hygiene of the home, and the prevention of the spread of infection are given to the patient. Contacts of all ages are examined, and special attention is paid to children who have been in close association with a tubercular person, this work being greatly facilitated by the close co-ordination which exists between the tuberculosis and school medical services.

An effort is made to keep continuously in touch with all notified cases of tuberculosis, either by periodical examination at the Dispensary or by home visiting, even though the disease may be arrested in order that, should a relapse or recrudescence of the disease occur, it may be detected early and treatment promptly provided. Patients who have received treatment are strongly urged to avail themselves of the service of the Tuberculosis Dispensary without delay, should they observe a return of symptoms of the disease.

A special feature of the anti-tuberculosis work in the City is its close co-ordination with the School Medical Service. The Dispensary is open specially on Wednesday afternoon for the examination and treatment of children attending the elementary schools, when cases of suspected tuberculosis found during the routine and special examinations are also referred to the Tuberculosis Officer. At the routine inspections of school children the nurses point out to the Medical Officer children coming from families in which cases of tuberculosis have occurred, and special attention is given to these children.

The special open-air class for Delicate Children, which was established in Denton Holme School in 1909, has been transferred to Newtown School, and is under the supervision of the Tuberculosis Officer. It is proposed to increase the accommodation of this class from 25 to 50 as a temporary measure until an open-air school can be established. Children suffering from anæmia and other defects likely to benefit by open-air regime, and also children suffering from early tuberculosis, are admitted, but tuberculous children liable to spread infection are excluded.

SOURCES OF INFECTION IN TUBERCULOSIS.

Since the discovery of the tubercle bacillus, which is the cause of the disease, in 1882, research into the nature and characteristics of the organism have been carried on both in this country and abroad, and it is now agreed that there are three distinct types or varieties of organism, viz., human, bovine, and avian types. The human type of tubercle bacillus is found almost solely in man, occasionally also in pigs; the bovine type is found principally in cattle, but it is also found in human beings, pigs, goats, sheep, and more rarely in other domestic animals; the avian type is found in birds, only on rare occasions has it been found in man, and as a cause of tuberculosis in man it can be ignored.

All types of tubercle bacilli have originally descended from a common stock, but as a consequence of its continued propagation in the same species of animals, each type has developed characteristics which enable it to be definitely distinguished, and successive generations always show the same characteristics as the original organisms. Experiments show that the human or avian bacillus when inoculated into cattle causes a localized tuberculosis, but

the organism retains the characteristics of its type and does not assume those of the bovine type. There is no reason to doubt, even in the absence of direct experimental evidence, that the converse of this holds good, and that the bovine bacillus when inoculated into human beings will retain the characteristics of the bovine type and not assume those of the human type. It is therefore possible in a case of tuberculosis to determine definitely the type of organism present and draw a safe conclusion as to the origin of the infecting bacilli.

During the last decade of the nineteenth century a vigorous campaign was urged against bovine sources of infection, while but little was done to check the spread of infection from human sources. In 1901 Koch stated that bovine tuberculosis was not transmissible to man, and although this statement has since been proved to be inaccurate, it did much good in focussing attention on the question of infection from human sources. What was of greater importance, however, was that this statement stimulated research into the characteristics of the tubercle bacillus, resulting in the discovery of methods by which the various types of the organism can be distinguished.

Bacilli obtained from all the forms of tuberculosis in human beings have been investigated, with the result that it is possible to estimate the proportion of cases in which the infection has been derived either from human or bovine sources.

The sputum of persons suffering from pulmonary tuberculosis has been examined in 938 cases, and in 932, or 99.2 per cent., the bacillus present was of the human type, in 4 cases the bacillus was of the bovine type, while in the two remaining cases bacilli of both types were found.

The bacilli present in the lungs themselves of 34 patients who died of pulmonary tuberculosis were examined, and in the case of 19 adults the bacillus was of the human type, while in 14 cases in children under the age of 12 years the human type of bacillus was found in 13 instances, and the bovine type only in one. It may therefore be safely asserted that 99 per cent. of cases of pulmonary tuberculosis are due to bacilli of the human type, the infection being derived from persons suffering from pulmonary tuberculosis in an advanced and infectious condition.

In other forms of tuberculosis, particularly of glands and bones, a higher proportion of cases were found to be due to the bovine type of bacillus; the younger the children the greater was the proportion of cases due to the bovine bacillus.

In tuberculous disease of glands occurring in children under five years, 87 per cent. of the cases were found due to bovine bacilli, while only 25 per cent. of the cases occurring among adults were due to this type of bacillus.

During the period of 7 years 1912-1918, 639 deaths from tuberculosis occurred in Carlisle, of which 471 were due to pulmonary and 168 due to other forms of tuberculosis. If the proportion of cases due to the human and bovine types of the tubercle bacillus is similar in Carlisle to that observed elsewhere, and there is no reason to believe that it is not, it may be inferred that of the 471 deaths from pulmonary tuberculosis, 466 were due to infection from human sources, while 131 of the 168 deaths from other forms of tuberculosis were also infected from the same source.

DEATHS FROM TUBERCULOSIS.

1912—1918.	Under 5 years.	5 —15 years.	Over 15 years.	Total.
Pulmonary Tuberculosis	12	30	429	471
Tubercular Meningitis	62	17	11	90
Abdominal Tuberculosis	15	3	9	27
Lupus ... ..	...	...	4	4
Tubercle of other Organs	8	6	9	23
General Tuberculosis	4	2	18	24
Total	101	58	480	639

Estimated number of Deaths due to human
and bovine types of tubercle bacilli.

	Under 5 years		5—15 years		Over 15 years		Total	
	Human	Bovine	Human	Bovine	Human	Bovine	Human	Bovine
Pulmonary Tuberculosis...	11	1	29	1	426	3	466	5
Tubercular Meningitis .	49	13	15	2	10	1	74	16
Abdominal Tuberculosis...	7	8	1	2	8	1	16	11
Lupus ... ..	...	...	...	...	2	2	2	2
Tubercle of other Organs	4	4	4	2	8	1	16	7
General Tuberculosis ...	3	1	2	...	18	...	23	1
Total	74	27	51	7	472	8	597	42

The above table shows that of the 639 deaths from tuberculosis in Carlisle it may be inferred that 597, or 93.3 per cent. were due to the human type, while in only 42 cases infection was due to the bovine type of bacillus. These figures refer only to fatal cases of tuberculosis and do not take into account the large number of cases which recover.

Infection during childhood is almost universal, and it has been demonstrated that at least 90 per cent. of children attaining the age of 15 years have at some time or other been infected with tuberculosis, although there may have been no symptoms or the manifestations of disease may have been so trivial as to pass unrecognised. Undoubtedly many conditions such as malnutrition, anæmia, and debility, which are so common among children, are due to some extent to an infection by tubercle bacilli, yet infection in childhood is in the majority of cases followed by recovery. This is borne out by figures relating to the mortality among notified cases of pulmonary tuberculosis. During the years 1913-1918 inclusive, 1,078 cases of pulmonary tuberculosis were notified. 440 were children under 15 years of age, of whom only 40, or 9 per cent., died; while 638 were adults, of whom 315, or 50 per cent., died. Bovine infection, whilst responsible for only a small proportion of deaths is responsible for a large amount of ill-health in childhood, and, therefore, while infection from human sources is of paramount importance in the causation of tuberculosis, infection from bovine sources cannot be neglected.

There is no doubt that the principal agent in infection at all ages is the sputum of those suffering from pulmonary tuberculosis, whether this occurs as actually recognisable phlegm, or in the form of minute droplets of moisture which are expelled from the mouth during coughing and sneezing, particularly of individuals in an advanced stage of the disease, some of whom may be too ill, too apathetic, or too regardless of the safety of others to cover the nose and mouth during coughing and sneezing.

Fortunately most people possess a certain amount of resistance to infection, and the risk of contracting tuberculosis under the ordinary circumstances of life is small, but constant association with an advanced case of the disease at home, more especially if the patient takes few or no precautions, is extremely liable to result in infection.

In most of the houses in the City, on account of the number of occupants, it is difficult for a person suffering from tuberculosis to have a separate bedroom, and in many cases it is even impossible to arrange for the patient to have a separate bed, and in conditions such as these the risk of the disease being communicated to others is very great. It is essential therefore that facilities for the treatment of such cases should be provided in a suitable hospital, and if such a hospital were established an important step towards the reduction of mortality from the disease would have been taken. Such a hospital must be attractive, comfortable, and easily accessible to the friends or relatives of the patients to whom ample opportunities for visiting the hospital should be afforded.

In the tuberculosis hospital, in addition to accommodation for the isolation of advanced cases, provision should be made for patients who may require treatment for a short period on account of complications, or who may be able to resume their occupation after a short period of hospital treatment. There are in attendance at the Tuberculosis Dispensary at the present time a number of persons suffering from tuberculosis, who, although not curable, could be considerably improved by hospital treatment. Such cases are not suitable for treatment in a sanatorium, and in the interests of early cases it is undesirable for intermediate cases to be treated in the same institution.

The importance of the early recognition of pulmonary tuberculosis cannot be too frequently emphasised, as it is obviously so much easier to maintain or improve the resistance when the balance of health has been only slightly disturbed than when the vitality has been greatly impaired by a prolonged and unaided struggle against the disease. Fortunately in Carlisle pulmonary tuberculosis is as a rule of a chronic type, which progresses slowly, and, when recognised in the early stages, is more amenable to treatment than the acute type, which progresses very rapidly in spite of treatment.

The following table sets out the percentage of notified cases dying within 1, 3, 6, and 12 months for the years 1913-1918 inclusive.

	Ages.	Number Notified.	Died before notification.	Died within 1 month.	Died within 3 months	Died within 6 months.	Died within 12 months.	Survived 1 year.
MALES.	All ages	525	0.6	6.0	11.4	17.9	21.0	79.0
	0—15	214	0.5	2.0	3.4	5.3	5.8	94.2
	15 & up	311	0.6	8.4	16.5	26.1	31.2	68.8
	15—20	46	...	4.4	10.9	15.2	19.6	80.4
	20—25	33	...	6.0	12.0	21.1	24.2	75.8
	25—35	104	...	7.7	12.5	24.0	28.8	71.2
	35—45	54	1.8	9.2	20.2	33.2	36.9	63.1
	45—55	49	2.0	10.1	24.4	32.6	42.8	57.2
	55 & up	25	...	16.0	24.0	32.0	36.0	64.0
FEMALES.	All ages	553	0.7	6.5	14.1	19.5	24.4	75.6
	0—15	226	...	3.9	4.3	4.7	6.2	93.8
	15 & up	327	1.2	8.2	20.8	29.7	37.0	63.0
	15—20	54	...	5.5	18.5	35.2	50.0	50.0
	20—25	63	...	1.6	12.7	22.2	27.0	73.0
	25—35	92	...	7.6	16.3	22.8	31.5	68.5
	35—45	57	3.5	14.0	28.0	33.2	36.8	63.2
	45—55	30	3.3	6.6	23.3	36.6	46.6	53.4
	55 & up	31	3.2	19.3	38.7	41.9	41.9	58.1

From the table mentioned it will be seen that 69 per cent. of the males and 63 per cent. of the females over the age of 15 survived for more than one year, a proportion higher than that in many other towns. It will also be observed, however, that only 50 per cent. of the females aged 15-20 at the time of notification survived more than one year, and it is at this age that most cases of acute phthisis occur.

**Survival of notified cases of Pulmonary
Tuberculosis.
Males and Females aged 15 years & upwards.**

	Year	Number Notified	Survived for					
			1 year	2 years	3 years	4 years	5 years	6 years
MALES.	1913	64	44	36	34	33	31	30
	1914	63	43	38	38	36	32	...
	1915	54	36	28	26	23	...	...
	1916	46	35	35	31	...	...	...
	1917	38	23	22	...	...	...	..
	1918	46	33	...	...	...	...	...
FEMALES.	1913	74	54	46	46	46	43	41
	1914	66	46	38	34	32	31	...
	1915	62	42	42	39	35	...	...
	1916	55	29	27	25	...	...	...
	1917	36	16	15	...	...	...	...
	1918	34	23	...	..	...	..	...

The above table shows that the mortality among persons who survive more than one year is small. The explanation of this fact is that persons suffering from the acute form of pulmonary tuberculosis and those suffering

from the more chronic form who are not notified until the disease is well advanced die within a short period of notification, while many persons who are notified in the earlier stages of the disease and receive sanatorium treatment improve sufficiently to resume their occupation for a varying period, and in some, amongst whom must be included most of the people who survive three years after notification, the disease is permanently arrested or cured.

There is a strong antipathy on the part of persons suffering from pulmonary tuberculosis in the earlier stages to notification and sanatorium treatment, and it is difficult to persuade them that it is only in the early stages that sanatorium treatment is likely to produce a permanent arrest of the disease. The antipathy to sanatorium treatment is undoubtedly a result of the misuse of sanatoria in the past. Owing to the absence of special accommodation for the treatment of persons suffering from tuberculosis in the more advanced stages of the disease, some patients, in whom there was no possibility of obtaining anything more than a temporary improvement of the disease, have been sent to sanatoria, and have either died there or have died within a few months of their return home. The deaths of such cases unfortunately become more widely known than the beneficial results where sanatorium treatment has been successful. The sanatorium is a most important unit in the scheme for the treatment of tuberculosis, but only selected early cases should be recommended for admission, the more advanced cases being treated in a tuberculosis hospital, and until this can be done the value of sanatorium treatment will not be correctly appreciated.

Increased knowledge of the early symptoms of tuberculosis, and of the importance of attending to recurring coughs, are essential before full benefit can be derived from efforts which are being made to eradicate the disease.

An effort is made to remain in touch with every surviving patient who has received treatment, so that advice and assistance can be given to those in need of it, and, by periodical examination, signs of renewed activity of the disease can be detected early. Relapses, like the primary onset of the disease, are often insidious and make considerable progress before the general health is sufficiently disturbed to produce symptoms which may be attributed by the patient to renewed activity of the disease.

Unfortunately many patients in whom the disease has been arrested are very unwilling to remain under medical supervision, and only present themselves for re-examination when the disease has again made considerable progress.

In the following tables the condition at the end of the year of 457 patients who have received sanatorium treatment since 1904 is set out. All the patients, with the exception of a few during the years 1913-1914, were treated in Blencathra Sanatorium.

Result of Sanatorium Treatment. Males.

Year.	Total Treated.	Dead.	Left City.	Not Traced.	Well and at Work.	Disease Active.	Killed on Active Service.
1904 ...	4	2	...	...	2	...	...
1905 ...	14	7	3	3	1	...	...
1906 ...	16	7	1	5	3	...	...
1907 ...	21	10	3	4	2	2	...
1908 ..	8	...	4	...	3	1	...
1909 ...	6	4	1	...	1	...	...
1910 ...	15	7	1	3	3	...	1
1911 ...	12	6	2	1	2	...	1
1912 ...	5	2	...	1	1	1	...
1913 ...	13	7	2	...	3	1	...
1914 ...	19	11	4	..	3	1	...
1915 ...	29	8	2	...	11	8	...
1916 ...	25	9	2	...	12	2	...
1917 ...	20	7	1	...	5	7	...
1918 ...	32	7	4	...	10	11	...
Total	239	94	30	17	62	34	2
Percentage ...		39.3	12.5	7.1	26.0	14.2	0.9

Females.

Year.	Total Treated.	Dead.	Left City.	Not Traced.	Well and at Work.	Well and Married.	Disease Active.
1904 ...	7	2	1	1	...	3	...
1905 ...	10	3	2	5	...	...	...
1906 ...	13	3	1	2	5	1	1
1907 ...	5	2	1	...	2	...	...
1908 ...	11	...	1	4	3	3	...
1909 ..	8	3	1	...	4	...	...
1910 ...	9	...	...	4	2	2	1
1911 ..	7	2	2	...	3	...	...
1912 ...	9	1	1	2	5	...	...
1913 ...	23	7	1	...	11	2	2
1914 ...	10	3	...	...	5	...	2
1915 ...	39	7	5	1	16	2	8
1916 ...	23	5	1	...	9	2	6
1917 ...	23	4	3	...	8	1	7
1918 ...	21	3	1	...	8	...	9
Total	218	45	21	19	81	16	36
Percentage ...		20.7	9.6	8.7	37.1	7.4	16.5

From these tables it will be observed that 26 per cent. of the males and 44.5 per cent. of the females were well and at work at the end of the last year, while in the case of 14.2 per cent. of the males and 16.5 per cent. of the females the disease was still active. Having regard to the fact that many of the patients who received sanatorium treatment were in the more advanced stages on admission, and not suitable cases for this form of treatment, these results are very satisfactory.

Tuberculosis during 1919.

The number of notifications of tuberculosis received during the year was 140, of which 13 were duplicates. Of the 127 primary notifications 104 were by medical practitioners and 23 by the School Medical Officers, 102 notifications relating to the pulmonary tuberculosis and 25 to other forms of the disease.

The ratio of primary notifications of tuberculosis to deaths was 205 notifications to 100 deaths.

Summary of Notifications of Pulmonary Tuberculosis from 28th Dec., 1918, to 27th Dec., 1919.

NOTIFICATIONS ON FORM A.

		Number of Primary Notifications.												Total Prim-ary Noti-fications.	Total Noti-fications on Form A.
Ages.		0-1	1-5	5-10	10-15	15-20	20-25	25-35	35-45	45-55	55-65	65 & up-wards.			
Pulmonary Males	...	1	..	...	1	5	3	12	7	6	3	2	40	45
Females	...	...	3	...	1	8	8	16	5	2	...	...	43	50
Non-pulmonary Males	...	...	3	3	2	1	..	1	1	...	...	...	11	12
Females	...	1	2	2	1	1	1	1	1	..	...	...	10	10
Totals	...	2	8	5	5	15	12	30	14	8	3	2	104	117	

NOTIFICATIONS ON FORM B.

		Number of Primary Notifications.					Total Noti-fications on Form B.
Ages.		Under 5.	5-10	10-15	Total Prim-ary Noti-fications.		
Pulmonary Males	...	...	4	3	7	7	7
Females	...	...	8	4	12	12	12
Non-pulmonary Males	...	1	1	..	2	2	2
Females	...	...	1	1	2	2	2
Totals	...	1	14	8	23	23	23

NOTIFICATIONS ON FORM C.

		Sanatoria.	Poor Law Institutions.
Pulmonary Males	...	32	2
Females	...	18	..
Non-pulmonary Males	...	...	...
Females	...	...	...
Totals	...	50	2

Distribution of Notifications of Tuberculosis in the various Wards of the City.

	Stanwix	Rickergate	Aglionby	Greystone	St. Nicholas	Currock	Denton Holme	St. Cuthbert's	Caldewgate	Newtown & Belle Vue	Carlisle
Pulmonary ...	7	6	10	11	11	10	20	10	10	7	102
Non-Pulmonary ...	...	3	...	7	4	2	6	1	2	...	25
Totals	7	9	10	18	15	12	26	11	12	7	127

The total number of deaths of residents registered from all forms of tuberculosis was 62, equal to a death-rate of 1.2 per 1,000 of the estimated population. Of this number, 46 (74.2 per cent.) were due to pulmonary tuberculosis, giving a rate of 0.9 per 1,000 of the estimated population at all ages.

Distribution of the Deaths in the various Wards of the City, 1919.

Wards	Stanwix and Eterby	Rickergate	Aglionby	Greystone	St. Nicholas	Currock	Denton Holme	St. Cuthbert's	Caldewgate	Newtown & Belle Vue	Total
Pulmonary ...	2	4	6	4	3	7	8	8	3	1	46
Non-Pulmonary ...	...	1	2	4	1	2	2	2	1	1	16
Totals	2	5	8	8	4	9	10	10	4	2	62

Age and Sex distribution of Deaths from Tuberculosis, 1919.

Ages.	0-1	1-5	5-10	10-15	15-20	20-25	25-35	35-45	45-55	55-65	65 and over.	Totals.
Pulmonary—												
Male	1	...	6	6	7	5	1	26
Female	2	...	1	4	1	4	6	1	1	20
Non-Pulmonary—												
Male	1	1	..	2	3	...	...	1	...	8
Female	4	2	1	1	..	...	...	...	..	8
Totals	7	3	2	8	4	10	12	9	6	62

A marked increase in the number of deaths from tuberculosis, particularly among women, has occurred in England and Wales since 1913, which has been attributed to the more extensive employment in munition factories and other industrial occupations under conditions of exceptional stress and strain, often associated with crowded lodging accommodation; but in Carlisle, although there has been a considerable amount of overcrowding owing to an influx of temporary residents in connection with the Gretna Factory and a larger proportion of occupied women, the mortality from tuberculosis has not increased, but, on the other hand, has tended to diminish.

The following table shows that deaths from tuberculosis fluctuated somewhat from 1908-1913, and then increased during 1914 and 1915, but since that year there has been a decline in the number of deaths from this disease, the mortality last year being 41.5 per cent. less than in 1915.

During the year 87 new patients attended the Tuberculosis Dispensary, and 25 were examined at home, making a total of 112 new cases.

1,020 visits were paid by patients to the dispensary for examination and supervision, while 58 visits were made by the Tuberculosis Officer to the homes of patients unable to attend the dispensary. 1,435 visits have been made to the homes by the Nurses for the purpose of advising upon and supervising the home life of the patients. 21 thermometers and 6 sputum cups and pocket flasks were given to patients, and in 8 instances cod liver-oil and malt extract was provided free of charge.

Deaths from Tuberculosis, Influenza, and other Respiratory Diseases, 1908—1919.

Year.	Pulmonary Tuberculosis.	Non-Pulmonary Tuberculosis.	Tuberculosis, all forms.	Influenza.	Other Respiratory diseases.
1908	56	34	90	10	125
1909	64	28	92	7	108
1910	52	30	82	6	91
1911	75	19	94	6	101
1912	65	11	76	8	125
1913	71	25	96	15	97
1914	70	32	102	9	97
1915	80	26	106	27	157
1916	66	29	95	26	96
1917	72	24	96	22	96
1918	48	19	67	107	133
1919	46	16	62	38	103

Tuberculin was injected in carefully selected cases, mostly children in the early stages, who, in spite of their open-air regime and liberal diet, failed to show improvement. 12 patients were treated with bacillary emulsion, and 4 patients received injections of Spengler's Immune Korper (serum); a total of 102 injections of tuberculin and serum were administered during the year.

The sputum of 51 patients was examined, in 20 of which the tubercle bacillus was found.

12 patients were receiving sanatorium treatment on 1st January, and 48 were admitted during the year, making a total of 60 who received treatment in the sanatorium. This number includes 3 patients who were admitted a second time. 47 patients were discharged and 3 died in the sanatorium, leaving 10 under treatment on 31st December

The total number of patient days in the sanatorium was 5,354, the average duration of residence for each patient being 107.8 days.

9 patients left the sanatorium before their period of treatment was completed, and 3 died, the average duration of residence of the 38 patients whose treatment was completed being 128.5 days.

The cause of death in the case of the 3 patients dying in the sanatorium was as follows:—Heart failure, 2; cerebral abscess, 1.

Condition of patients on discharge:—

Disease much improved	...	...	...	24
Disease improved	...	...	...	19
Disease unchanged	...	...	...	3
Disease worse	...	...	...	1
				<hr/>
				47
				<hr/>

TREATMENT OF DISCHARGED SAILORS AND SOLDIERS.

The Tuberculosis Officer has acted as medical referee to the City of Carlisle War Pensions Committee and the Pensions Medical Board, and has examined and reported upon all pensioners referred to him.

During the year 32 discharged sailors and soldiers have attended the Tuberculosis Dispensary for treatment and supervision, 17 of whom were new and 15 old patients. 181 attendances were made at the dispensary by these men, while 16 visits were paid by the Tuberculosis Officer to the homes of those who were too ill to attend. Of the 17 new cases, 9 were suffering from tuberculosis of the lungs in an early stage, in 4 the disease of the lungs was more advanced; 2 were suffering from tuberculous glands of the neck, and in 2 instances the men were not found to be suffering from tuberculosis. The homes of tuberculous discharged sailors and soldiers have been systematically visited, and the men kept under supervision by the Tuberculosis Nurses, who have paid 16 primary and 88 subsequent visits to their homes.

Of the 11 tubercular soldiers and sailors who received treatment in the sanatorium during the year, 9 were discharged, 1 died of cerebral abscess 31 days after admission, while 1 was receiving treatment at the end of the year. The average duration of residence of the 9 patients in the sanatorium was 73 days, a period much shorter than the average of other patients. This was due to the fact that only 4 remained until the completion of the period of their treatment, the others became restless while under treatment, and refused to remain longer. One soldier who received treatment had previously been a patient in the sanatorium during 1915 prior to joining the army.

MATERNITY AND CHILD WELFARE.

INSPECTION OF MIDWIVES.

The Local Supervising Authority received notice of intention to practice midwifery from 8 midwives in January, and from 6 others during the course of the year, making a total of 14, while 7 left the district during the year. At the end of the year only 5 midwives were actively engaged in the practice of their profession, two of whom were working under the auspices of the Carlisle District Nursing Association.

764 cases of confinement were attended by midwives during the year. Notices were received by the Local Supervising Authority from midwives for the following conditions:—

Cases in which a midwife had advised the			
sending for medical help	...	...	102
Notifications of still-births	...	...	25
Notices relating to the substitution of artificial			
for breast feeding	...	...	31

The midwives have been visited at their homes and also seen at the office of the Medical Officer of Health, their registers carefully examined and checked, their bags, appliances, &c., also examined. There was no prosecution during the year in respect of offences under the Midwives Acts.

Duties of Health Visitors.

Home visiting in connection with the Maternity and Child Welfare Scheme has, during the past year, been carried out by the three Corporation Health Visitors, whose principal duty is to supervise the welfare of children until they attain school age. The Health Visitors visit in connection with practically every birth about the tenth day following the confinement, *i.e.*, after the doctor or midwife has ceased to attend, except in special cases, such for example as when the infant has developed ophthalmia. In connection with these cases a visit is made upon receipt of the notification from the doctor or midwife. Visits to the mothers and babies are subsequently made as frequently as may be necessary until the child attains the age of 5 years. During these visits the Health Visitors give advice as to the feeding, clothing, and rearing of the children, and also instruction in domestic hygiene. It is also the duty of the Health Visitors to visit and advise expectant mothers; to inquire into still-births and deaths of children under the age of 5 years; to visit all known children who are nursed apart from their parents; to investigate cases of ophthalmia neonatorum, measles, whooping cough, and other infectious diseases among young children, and give such advice as may be necessary in connection with the nursing of these diseases at home, and where, owing to the presence of complications or the lack of facilities for nursing the patient at home, it is considered advisable to remove the patient to the hospital, to report the facts to the Medical Officer of Health. The Health Visitors also visit the Babies' Welcomes and give short talks to the mothers on infant management.

Maternity Hospital.

Considerable progress has been made towards the establishment of a maternity hospital. Possession was obtained of two houses, Nos. 3 and 4 George Street, a quiet street near the centre of the town, with a large pleasant

garden in front and an open aspect at the rear. The necessary alterations and decorations have been completed, and it is hoped that the hospital will shortly be opened.

The premises comprise the following accommodation :-- The entrance to No. 3 constitutes the main entrance to the hospital. On the left-hand side of the entrance lobby is a doorway leading into the waiting room, which will also be used as a lecture room when required. Immediately behind this is the Medical Officer's consulting room, while the entrance to No. 4 has been built up and the lobby converted into a weighing room for infants. The room on the right of the entrance lobby is to be the nurses' dining and sitting room, and communicates with the kitchen by a service hatchway. The kitchen of No. 3 will be used as a servants' hall, and the wash-house has been converted into a working kitchen and is provided with a large gas cooker, to which has been added a scullery and larder between the kitchen and the servants' room. Certain out-buildings behind No. 4 have been removed to open up the yard and permit of better lighting and ventilation of the consulting room, and the two yards have been thrown into one and enlarged by enclosing a portion of the lane behind. The area below the projecting bathroom and lavatory of No. 4 has been enclosed to provide a shelter for perambulators. The yard also contains separate water-closets for out-patients and servants, and a coalhouse.

The basement of No. 4 will be utilised for the drying and ironing of clothes, washing of waterproof sheets, &c., and will provide certain storage accommodation for household requisites. The boiler supplying hot water for the hospital, which will also provide heat in connection with the drying of clothes, is also situated in the basement.

On the first floor there are two large and two small rooms; the two large front rooms have been connected by a doorway and will form two wards each containing three beds and cots. One of the back-rooms contains a bed and a cot, and will be utilised as a small ward for special or observation cases. The other back-room will be used as an accouchement and operating room, and has been equipped with all the necessary sterilising apparatus, instruments, &c.

The bathroom of No. 4 has been altered so as to provide a stop closet for washing and flushing bedpans, a bathroom, and also a water-closet for patients.

On the second floor are the Matron's sitting room and bedroom, bedrooms for nurses, a bathroom and W.C., while the attics have been improved and made cosy and suitable for the accommodation of the servants.

INFANT CONSULTATIONS.

The object of the Infant Consultation Clinic is to provide advice and simple treatment for ailments of infants and young children, in so far as this is not at present available. It should be understood that these consultations do not provide for the treatment of cases of acute illness, provision for which exists at the Cumberland Infirmary, and therefore it is not proposed at present to provide beds in connection with the Consultation Clinic for the in-patient, observation, or treatment of infants and young children.

It is proposed that the examination of ailing infants and young children shall take place at George Street on Tuesday afternoons from 2 p.m. to 4-30 p.m. Cases will be referred to the Consultation Clinic from the Babies' Welcome on the recommendation of the Medical Officer or Health Visitors; from the Crèche by the Medical Officer

or Matron; by the Health Visitors in the course of their systematic visits to infants and young children up to the age of 5 years; by the Medical Officer in such other circumstances as may be considered necessary; by doctors either in private practice, or on the staffs of other public institutions, and also by nurses and midwives either in practice or on the staffs of institutions.

Advice as to feeding and nursing of ailing children will be given so long as is necessary, and minor treatment will also be provided. Cases of an acute nature will be referred to an appropriate institution.

Ailing children will continue in attendance at the Consultation Clinic until better, and will then be referred back to the Babies' Welcome of the district in which they reside.

MATERNITY CLINIC.

Pregnant women, as they become known to the officers and workers of the Corporation and the Babies Welcomes, will be referred to the Maternity Clinic at Nos. 3 and 4 George Street, where they will be able to have the advice of the Medical Officer on Friday afternoons between 2 p.m. and 4-30 p.m. The Medical Officer will inquire into the previous confinements, with a view to ascertaining whether any complication may be expected before, during, or after the confinement. Such provision as may be necessary will be made, to remedy or ameliorate conditions likely to lead to complications. Attention will be specially directed to the condition of women expecting their first baby, and women who have had complications during previous confinements. Advice by means of personal talks to the mothers and expectant mothers will be given by the Medical Officer and Health Visitors on the care of the health and preparation for confinement, on preparation for the well-being of the baby, and on the preservation of the health of the nursing mother and infant.

Women suffering from illnesses due to pregnancy will be advised, and, as far as possible, treated; advice and treatment will also be given to women ailing as a result of recent child birth.

Cases requiring hospital treatment before or after confinement, cases where complications are to be expected, and also cases which cannot be safely confined at home, will be registered by the Medical Officer for admission to hospital.

MATERNITY HOSPITAL.

The hospital will contain seven beds and also cots for infants. This accommodation will provide for cases in which difficult labour is anticipated, especially in the case of women suffering from pelvic and other deformities likely to render labour difficult and prolonged. It is not intended with this limited accommodation to provide for immediate admission of emergencies arising during confinements conducted at the homes of mothers.

Provision will also be made as far as possible for cases of women who, in the opinion of the Medical Officer of Health, cannot with safety be confined in their own homes, and such other provision for securing proper conditions for the confinement of necessitous women as may be approved.

Provision will also be made for resting and treatment, especially during the later period of pregnancy of women suffering from complications which, in the absence of this precaution, would be likely to render the labour dangerous. Women suffering from certain complications following parturition will also be admitted for rest and treatment.

NOTIFICATION OF BIRTHS ACTS.

During the year 1,198 notifications of births were received, 1,145 of which related to live births and 53 to still-births, occurring after the 28th week of pregnancy.

In 21 instances no notification of birth was received, the first intimation of the birth being that obtained from the Sub-Registrar's weekly return.

No. of live births notified by Doctors or Midwives...	1,134
„ „ „ other persons ...	11
„ „ not notified	21
	<hr/>
Total live births ...	1,166
No. of still-births notified	53
	<hr/>
Total number of births ...	1,219
	<hr/>

During the past year the Health Visitors paid 9,513 visits for the purpose of supervising infant welfare.

No. of primary visits	1,081
„ subsequent visits to children under 1 year...	2,602
„ „ „ 2 years	1,604
„ „ „ 3 „	1,496
„ „ „ 4 „	1,571
„ „ „ 5 „	1,159
	<hr/>
	9,513
	<hr/>

Feeding of Infants.

The following table sets out particulars of information obtained during the first visit of the Health Visitors in respect of feeding:—

No. of children fed entirely on the breast	882
„ fed partly on the breast and partly on the bottle	38
„ fed by means of (a) boat-shaped bottle	136
„ fed by means of (b) a long-tube bottle	16
„ fed by other means, <i>e.g.</i> , spoon ...	7
„ dying soon after birth and not fed	20
No information (cases not visited)	48

The above table shows that 920, or 85.6 per cent., of the newly-born babies were fed either entirely or partly on the breast, while 152, or 14.1 per cent. were fed by means of a bottle.

Under a new rule of the Central Midwives' Board it is now the duty of a midwife to make out and send to the Local Supervising Authority a notice in cases where artificial feeding is substituted for breast feeding, and one is greatly impressed by the number of cases in which artificial feeding is unjustifiably introduced shortly after birth. There are instances in which, on account of the inability of the mother to secrete milk, artificial feeding is necessary, but in many cases artificial feeding is substituted by the mother on her friends' and neighbours' advice, even though she may have an adequate secretion of milk. In some instances mothers, although they apparently have plenty of breast milk, are so lacking in motherly instinct that they refuse to suckle their babies' in spite of all advice to the contrary. In other instances the bottle is resorted to in cases where a mother wishes to return to work as soon as possible after the confinement. The complete substitution of natural nourishment by artificial feeding in these cases is unnecessary, as it is always possible for a mother who goes out to work to give her baby breast feeds morning and evening, and only in cases where she is unable to arrange for further breast feeding during the day should bottle feeds be substituted for one or two breast feeds. Such a compromise would be more conducive to the well-being of the baby than total artificial feeding, and when adopted is found to diminish the chances of an infant suffering from indigestion, diarrhœa, rickets, and other serious ailments.

Old ideas in connection with infant feeding are difficult to eradicate, and I am convinced that more infants are killed annually by kindness in the form of overfeeding than by the want of adequate nourishment. Undoubtedly

most of the diarrhœa and many of the deaths due to wasting and convulsions originate primarily in ignorance with regard to the correct methods of infant feeding, yet in spite of the education given by schools for mothers, home talks by health visitors, professional advice, and Press propaganda, mothers persist in following improper methods of feeding.

In no branch of preventive medicine is progress so seriously retarded by ancient beliefs as in connection with the rearing of babies. It is the experience of those concerned in infant welfare work that very often after carefully explaining to a young mother the correct method of infant feeding the grandmother or a neighbour makes the statement that she knows how to feed a baby, having fed so many, but in most instances she omits to relate how many babies have been sacrificed as a result of the method.

Many mothers persist in supplementing adequate breast feeding by additional feeds of cow's milk or—what in the case of infants under six months is much worse—some preparation of starchy food which babies of that age are unable to digest, with the result that stomach disturbances are set up and either the child's progress is delayed or definite disease follows. The proportion of cases in which it is necessary to supplement breast feeding is very small indeed, and in no case should a baby fed on the breast be given additional food during the first six months unless medical advice has first been obtained.

The practice of weaning infants and substituting starchy food for milk as early as the third or fourth month is equally reprehensible. Weaning should never be commenced before the sixth month and should be carried out slowly, breast feeding being gradually substituted and the weaning not completed until three months later.

The following table sets out the deaths of infants under one year in relation to the method of feeding:—

Number of deaths of breast-fed infants	...	39
„ „ bottle-fed infants	...	35
„ „ infants fed by spoon	...	4
„ „ infants partly fed on breast and partly by means of bottle	...	14
„ infants dying soon after birth and not fed	... ..	22
No information as to feeding	... ..	1
		<hr/> 115 <hr/>

Of the 882 children fed entirely on the breast only 39 died, equal to an infant mortality rate of 44.2 per 1,000, while of the 152 infants who were fed by means of a bottle 35 died, equivalent to an infant mortality rate of 230 per 1,000.

It is of interest to note in this connection that of the 7 infants who died of diarrhœa only 2 were breast fed while 2 were fed partly on the breast and partly by means of a bottle, and 3 were fed entirely by means of a bottle.

STILL-BIRTHS.

During the year 53 notifications relating to children born dead after completion of the 28th week of gestation were received, equivalent to a rate of 45 still births per 1,000 live births. 9 of the still-births occurred during the seventh month of gestation and 6 during the eighth month, while 38 occurred about the full term of gestation. In only 18 instances was it possible to obtain information as to the actual or probable cause of the still-births, which was as follows:—

Prematurity	...	...	...	...	1
Hydrocephalus	...	...	...	...	2
Difficult labour	...	...	...	...	6
Accident to mother	...	...	...	...	3
Over work on part of mother	...	...	...	...	2
Illness of mother	...	...	...	...	4
					<hr/> 18 <hr/>

INFANT MORTALITY.

The total number of deaths of infants under one year during 1919 was 117, the number of deaths of residents being 115, equivalent to a nett infant mortality rate of 107.9 per 1,000 births. During the previous year the number of infant deaths was 131, equal to an infant mortality rate of 126.8 per 1,000.

The infant mortality rate for the whole of England and Wales during 1919 was 89 per 1,000 births; for the 96 great towns (of which Carlisle is one) 93 per 1,000 births; and for the 148 smaller towns 90 per 1,000 births.

Of the 115 deaths 67 occurred among males and 48 among females, equivalent to infant mortality rates of 120.3 per 1,000 for males and 94.8 per 1,000 for females.

19 deaths occurred among illegitimate infants, equivalent to an infant mortality rate of 202.1, the corresponding rate for legitimate children being 98.8 per 1,000.

Rates of Mortality among Male, Female, Legitimate, and Illegitimate Infants per 1,000 Births.

Year.	Both Sexes.	Males.	Females.	Legitimate.	Illegitimate.
1909	123.6	142.3	103.7	116.8	204.5
1910	110.0	123.9	93.5	106.4	163.6
1911	145.0	165.2	124.5	142.0	200.0
1912	102.4	122.5	84.2	103.0	123.0
1913	127.1	147.6	107.5	119.0	280.0
1914	122.4	111.2	134.4	108.5	328.9
1915	144.3	150.6	137.7	133.0	338.4
1916	101.5	115.3	105.9	95.8	172.8
1917	106.5	118.6	95.5	103.3	142.8
1918	126.8	135.4	117.8	109.5	325.3
1919	107.9	120.3	94.8	98.8	202.1

The causes of death among infants may be divided into two groups, viz., unavoidable and avoidable. Under the former heading are classified deaths due to pre-natal or neo-natal (newly born) influences, the principal causes being prematurity, atrophy, debility and marasmus, congenital malformations, and failure of the lungs to expand normally, and it is from these causes that most deaths occur during the first month of life. During the past year 51 deaths occurred in the first month of life, of which 39 were due to unavoidable causes, the remaining 12 being stated as due to convulsions, bronchitis, pneumonia, diarrhœa, and syphilis, all of which might possibly have been avoided.

The death-rate during the first month of life remains fairly constant from year to year, although the total infant mortality rate shows considerable variations, and so far all efforts directed towards the reduction of infant mortality have failed to materially influence the mortality during this period. The factors which determine this operate during the pre-natal period, and, therefore, any hope of reducing this mortality lies in improving the health and environment of expectant mothers.

Of the 64 deaths which occurred after the first month of life, practically all may be classified as due to avoidable causes, as the deaths, occurring after the first month, which are certified as due to atrophy, debility, and marasmus, have their origin in most cases in unsuitable feeding. Respiratory diseases were the principal cause of death, 14 deaths being due to pneumonia, 6 to bronchitis, and 4 to measles complicated by broncho-pneumonia. 11 deaths were due to diarrhœa and enteritis, both of which are usually due to improper feeding or uncleanness.

Examination of the table on page 67 shows that the reduction of mortality during the past year took place among infants aged 3—12 months. During 1918 20 deaths under 1 year were due to whooping cough, while during last year no infant death was due to this cause.

Rates of Mortality among Infants at various ages, and from the principal causes per 1,000 births.

Year	Nett Infantile Mortality Rate	AGES.					CAUSES.				
		Under 4 Weeks	4 Weeks and under 3 Months	3 Months and under 6 Months	6 Months and under 9 Months	9 Months and under 12 Months	Premature Birth	Atrophy, Debility & Marasmus	Diarrhoea and Enteritis	Bronchitis and Pneumonia	Whooping Cough
1909	123.6	47.9	26.1	20.9	14.8	13.9	21.7	17.4	20.9	13.1	4.4
1910	109.1	41.9	19.1	21.0	15.7	11.4	28.8	13.1	12.2	14.8	4.4
1911	145.0	45.0	27.0	27.0	25.2	20.8	18.0	12.6	37.9	26.1	9.0
1912	102.4	42.0	15.8	16.6	17.5	10.5	15.8	15.8	9.6	21.9	6.1
1913	127.1	49.8	17.2	27.5	19.0	13.7	28.4	12.9	19.0	18.0	3.4
1914	122.4	48.0	25.6	21.5	15.7	11.6	19.8	15.7	20.7	18.2	5.8
1915	144.3	51.2	30.2	26.8	14.3	21.8	30.2	12.6	15.9	20.1	10.1
1916	101.5	47.1	13.6	16.3	15.4	9.1	27.2	7.3	17.2	14.5	0.0
1917	106.5	39.4	16.1	23.3	15.2	12.7	20.6	7.2	24.2	10.7	1.8
1918	126.8	38.7	17.4	26.1	30.0	14.5	22.3	10.6	14.5	25.2	19.4
1919	107.9	45.9	17.8	18.8	13.1	12.3	19.7	22.5	13.1	20.6	0.0

Distribution of Deaths of Infants under one year in the several Wards.

	Stanwix & Etterby	Rickergate	Aglionby	Greystone	St. Nicholas	Currock	Denton Holme	St. Outhbert's	Caldewgate	Newtown & Belle Vue	Whole City
Legitimate ..	2	6	8	10	17	5	19	12	14	3	96
Illegitimate ...	2	3	1	1	—	2	3	3	2	2	19
Total ...	4	9	9	11	17	7	22	15	16	5	115

Infant Mortality Rates for the various Wards, 1918-1919.

Year.	Stanwix & Etterby	Rickergate	Aglionby	Greystone	St. Nicholas	Currock	Denton Holme	St. Cuthbert's	Caldewgate	Newtown & Belle Vue	Carlisle
1918	108.7	141.2	135.4	101.7	94.9	93.8	125.0	193.3	156.2	97.2	126.8
1919	81.6	97.8	123.3	83.9	125.0	65.4	160.6	119.0	115.1	65.8	107.9

Nett Deaths from stated causes at various ages under one year of age.

CAUSE OF DEATH.				Under 1 Week.	1-2 Weeks.	2-3 Weeks.	3-4 Weeks.	Total under 4 Weeks.	4 Weeks & under 3 Months.	3 Months and under 6 Months.	6 Months and under 9 Months.	9 Months and under 12 Months.	Total Deaths under One Year.
All Causes.	{	Certified ...	...	32	9	3	5	49	18	17	11	13	108
		Uncertified ...	...	1	.1	...	...	2	...	4	1	...	7
{		Measles ...	...	...	...	...	...	...	...	...	1	3	4
		Scarlet Fever ..	...	...	...	...	...	...	...	...	1	...	1
		Convulsions ...	...	4	1	...	...	5	...	3	2	...	10
		Bronchitis ..	...	...	...	...	1	1	2	1	2	1	7
		Pneumonia (all forms) ...	...	...	1	...	...	1	2	3	2	7	15
		Diarrhœa ..	...	1	1	...	1	3	...	4	...	...	7
		Enteritis ...	...	...	...	...	...	...	1	3	1	2	7
		Syphilis ...	...	...	...	...	1	1	1	...	...	...	2
		Atelectasis ...	...	5	...	...	...	5	...	...	...	...	5
		Congenital Malformations ...	...	2	...	...	...	2	1	2	...	...	5
		Prematurity ..	...	16	2	...	1	19	2	...	...	...	21
		Atrophy, Debility & Marasmus...	...	4	5	3	1	13	7	4	2	...	26
		Other Causes ...	...	1	...	...	...	1	2	1	1	...	5
		Totals ...				33	10	3	5	51	18	21	12	13	115
Nett Births in the year.				{ Legitimate, 972 Illegitimate, 94				Nett Deaths in the year				{ Legitimate Infants, 96. Illegitimate „ 19.	

Deaths occurring among Children aged 1 to 5 Years.

Investigations into the cause of death of 52 children aged 1 to 5 years were made during the year.

46 of the children belonged to Carlisle while 6 came from other districts. 12 of the deaths occurred in the Cumberland Infirmary, 7 being of Carlisle children and 5 from other districts, while 1 child from an outside district died in the Isolation Hospital.

The number of children dying at each age was as follows:—

1-2 years.	2-3 years.	3-4 years.	4-5 years.	Total.
21	12	11	8	52

The number of deaths occurring from the various causes is given below.

DISEASES OF THE RESPIRATORY SYSTEM	...	...	...	20
Pneumonia	...	...	...	12
Acute Bronchitis	...	...	...	2
Empyema	...	...	...	1
Acute Laryngitis	...	...	...	3
Influenza	...	...	...	2
TUBERCULAR DISEASES	...	...	...	8
Tuberculosis of the Lungs	...	...	...	2
Tubercular Meningitis	...	...	...	3
„ Peritonitis	...	...	...	2
„ Hip Joint	...	...	...	1
INFECTIOUS DISEASES	...	...	...	11
Measles	...	...	...	6
Diphtheria	...	...	...	3
Scarlet Fever	...	...	...	1
Whooping Cough	...	...	...	1

INTESTINAL DISEASES	...	...	...	4
Gastro enteritis	...	...	...	2
Marasmus	...	...	...	2
OTHER DISEASES AND ACCIDENTS	...	...	...	9
Heart Disease	...	...	...	2
Meningitis	...	...	...	1
Convulsions	...	...	...	1
Accidents	...	...	...	5

BOARDED-OUT CHILDREN.

By agreement with the Clerk to the Guardians of the Poor Law Union information contained in the register of persons maintaining children apart from their parents for gain is available for the use of the Health Visitors. All children who are boarded out are visited by the Corporation Health Visitors.

Any conditions found in these houses which, in the opinion of the Health Visitors, are detrimental to the well-being of such children are reported, and any matter relating to the administration of the Guardians is reported to the Clerk to that authority.

During the year the Health Visitors paid 65 visits to houses for the purpose of supervising the welfare of children nursed apart from their parents.

BABIES' WELCOMES AND SCHOOL FOR MOTHERS.

The Babies' Welcomes and School for Mothers, which were inaugurated in 1905 by the Charity Organisation Society, are now managed as an independent organisation by a Committee of ladies. At the end of the year there were three Babies' Welcomes, viz., Central, Caldewgate, and Botchergate, which are all open on Monday afternoons. Demonstrations in cookery and the making of babies' garments, &c., and talks on infant management and hygiene are given by voluntary workers and the Corporation Health Visitors. The latter attended the Welcomes

on 56 occasions during the past year for this purpose. The babies are weighed periodically, and the Committee have made arrangements for a doctor to attend each centre once a month to examine children and give advice on minor ailments.

During the year ending March 31st, 1919, 1,885 attendances were made at the Welcomes; 83 health talks and 6 cookery demonstrations were given for the benefit of the mothers.

The voluntary workers and the paid full-time visitor connected with the Welcomes co-operate with the Corporation Health Visitors in visiting the children in their homes. These workers paid 4,577 visits during the year and also 178 special visits in the case of illegitimate children.

DAY NURSERY.

The Carlisle Day Nursery, to which the Corporation has recently made a donation, is maintained by voluntary subscriptions, aided by a grant from the Ministry of Health.

The following table gives a summary of the attendance at the nursery during the year—

	Whole atten- dances.	Half atten- dances.
Children under 3 years of age	1723	307
Children over 3 years of age	276	40

PUERPERAL FEVER.

During the year only one person was notified as suffering from puerperal fever. The confinement was attended by a midwife, and the baby was born as the midwife entered the house. The illness was not severe, and the patient made a satisfactory recovery.

OPHTHALMIA NEONATORUM.

Number	Age at time of Notification.	Condition of Eye.	Result.
1	8 days	Inflammation of conjunctivæ, no discharge	Cured, no permanent damage
2	4 "	Do.	Do.
3	14 "	Right conjunctiva swollen and inflamed, no discharge	Do.
4	6 "	Left conjunctiva swollen, small amount of purulent discharge	Do.
5	21 "	Both conjunctivæ inflamed and discharging muco-pus	Do.
6	11 "	Both eyes inflamed, free discharge of pus	Do.
7	11 "	Do. (treated in Cumberland Infirmary)	Do.
8	6 "	Slight inflammation of conjunctivæ, no discharge	Do.
9	11 "	Left conjunctiva swollen and inflamed, purulent discharge.	Do.
10	4 "	Left conjunctiva swollen and inflamed, purulent discharge	Do.
11	8 "	Both conjunctivæ inflamed, purulent discharge	Do.
12	6 "	Do. slight purulent discharge	Do.
13	13 "	Marked inflammation of both conjunctivæ and free discharge of pus	Do.
14	6 "	Inflammation of both conjunctivæ, no discharge	Do.
15	6 "	Do. purulent discharge	Do.
16	8 "	Do. no discharge	Do.
17	7 "	Inflammation of both conjunctivæ, purulent discharge	Do.
18	7 "	Do. do.	Do.
19	2 "	Do. no discharge	Do.
20	5 "	Do. slight purulent discharge	Do.
21	11 "	Left conjunctiva inflamed, purulent discharge	Do.
22	17 "	Do. do.	Do.
23	10 "	Do. do.	Do.
24	5 "	Do. do.	Do.
25	8 "	Right conjunctiva inflamed, profuse discharge. Left conjunctiva inflamed	Do.
26	8 "	Both conjunctivæ inflamed, purulent discharge	Do.
27	10 "	Do. do. from left eye	Do.
28	10 "	Left conjunctiva discharge of thin muco-pus	Do.
29	11 "	Right conjunctiva inflamed, purulent discharge	Do.
30	13 "	Left Do. slight discharge of muco-pus	Do.
31	4 "	Both conjunctivæ do. slight purulent discharge	Do.
32	7 "	Do. do. no discharge	Do.
33	2 "	Right conjunctiva inflamed, slight purulent discharge	Do.
34	11 "	Left do. do. purulent discharge	Do.

OPHTHALMIA NEONATORUM.

34 cases of ophthalmia neonatorum occurred during the year, 8 of which were notified by medical practitioners, 16 by midwives, while 5 cases were notified both by doctor and midwife. In five instances no notification was received. These cases were discovered by the Health Visitors at their primary visit on the tenth day after birth.

In 22 instances both eyes were affected, and in the remaining 12 only one eye was inflamed. All the cases recovered without any damage to the eye. Details of the cases are given in the table on preceding page.

MEASLES.

During the past year the City experienced an outbreak of measles, 1307 cases of the disease being notified. During the first six months only four cases were notified. The number of notifications received, however, increased slightly during the summer months, and about the middle of September the disease assumed an epidemic character. During the last 16 weeks of the year 1267 notifications of cases of the disease were received.

The epidemic was at first confined to Currock and Rickergate Wards, whence it spread to the other wards on the east side of the City and to Stanwix, but it was not until it had attained its maximum intensity in November that many notifications were received from the wards on the west side of the City.

The following table sets out the number of cases and the number of deaths occurring each week during the epidemic.

Week ending	Cases Notified.			Deaths.		
	Males	Females	Total	Males	Females	Total
September 13	3	1	4	...	...	...
" 20	12	15	27	...	...	...
" 27	20	21	41	...	..	...
October 4	35	41	76	...	1	1
" 11	69	69	138	...	...	...
" 18	48	41	89	..	...	...
" 25	71	51	122	...	..	..
November 1	50	31	81	...	1	1
" 8	52	57	109	1	...	1
" 15	47	40	87	...	...	...
" 22	57	62	119	...	1	1
" 29	75	57	132	2	1	3
December 6	47	52	99	1	...	1
" 13	41	49	90	3	...	3
" 20	11	26	37	...	1	1
" 27	9	7	16	..	...	...
Totals ..	647	620	1267	7	5	12

In the following tables are given the number of cases occurring during the last four months in each ward of the City, with the attack rate per 1000 persons, the number of deaths, and the case mortality.

	Stanwix	Rickergate	Aglionby	Greystone	St. Nicholas	Currock	Denton Holme	St. Cuthbert's	Caldewgate	Newtown and Belle Vue	Carlisle
No. of Cases ...	59	91	103	123	156	241	138	120	162	74	1267
Attack Rate } per 1000 }	13.8	13.9	18.0	19.0	25.4	44.5	21.4	19.0	28.5	18.0	22.5
No. of Deaths ...	...	2	1	.	3	1	1	1	1	2	12
Case Mortality ...	...	2.2	1.0	...	1.9	0.4	0.7	0.8	0.6	2.7	1.0

Age distribution of Cases of Measles.

Ages.	0—1	1—2	2—3	3—4	4—5	0—5	5—10	10 & over	Carlisle
No. of Cases ..	56	123	132	149	224	684	548	35	1267
Attack Rate } per 1000 }	49.7	112.7	117.8	134.5	199.8	122.2	97.7	...	22.5
No. of Deaths	4	1	3	1	1	10	2	0	12
Case Mortality	7.1	0.8	2.2	0.7	0.4	1.5	0.4	0.0	1.0

684, or 54 per cent. of the cases, occurred in children under the age of 5 years, the maximum incidence being on the children aged 4—5 years, of whom one-fifth were attacked by the disease, while 583, or 46 per cent. of the cases, occurred in children over 5 years of age. 12 cases were fatal, equal to a case mortality of 0.95 per 100 cases; 10 of the deaths were among children under the age of 5 years. In measles the younger the child the greater is the liability to a fatal termination; the bulk of deaths due to this disease occur among young children. This will be seen from the figures given in the preceding table, which shows that although fewer cases occur among very young children, the case mortality was considerably higher.

In spite of warnings as to its dangerous nature many parents still cling to the old belief that a child must have measles, and consequently they have no hesitation in exposing a child, however young, to the risk of infection. If children were protected from measles until they had attained the age of five years the mortality would be almost negligible. During the past eight years 104 deaths have occurred from measles, 53 of which occurred among children under the age of 2 years, and 37 among children age 2—5 years, while in only 14 instances were the children over the age of 5 years.

The Corporation Health Visitors investigated all cases of measles which were notified to me by medical practitioners, parents, school teachers, and attendance officers, or brought to my notice in other ways, and gave instructions to the parents as to the isolation of the case, and the prevention of the spread of infection to other members of the house, particularly young children. Advice as to nursing the disease was given to the parents, and cases complicated with bronchitis or pneumonia were reported to me, with a view to the patient being removed to the Isolation Hospital when accommodation or facilities for adequate nursing did not exist in the home.

2,093 visits were paid by the Health Visitors to the homes of children in connection with measles, 1,200 being primary visits and the remainder being visits subsequently paid to complicated cases and to the homes of patients where nursing was not satisfactory. In 72 instances the Health Visitors found patients seriously ill owing to the disease being complicated by broncho-pneumonia or bronchitis. 24 such patients who could not be satisfactorily nursed at home were removed to the Isolation Hospital for treatment, all of whom recovered.

WHOOPING COUGH, CHICKEN POX, AND MUMPS.

During the year 93 notifications relating to whooping cough were received from head teachers and attendance officers, compared with 551 in 1918.

Only one death was certified as due to this disease during 1919, compared with 34 during the previous year.

From the same sources 123 notifications relating to chicken pox and 190 relating to mumps were received during the year.

49 special visits were paid by the Health Visitors to children under the age of 5 years suffering from these diseases.

DIARRHŒA.

During the year 18 deaths were registered as due to diarrhœa and enteritis as against 24 during 1918. The mortality rate from the disease was .33 per 1,000 living at all ages.

Table showing the age distribution of death from Diarrhœal Diseases.

Ages ...	0 to 1	1 to 2	2 to 5	5 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and over
Diarrhœa	7	1	...	1	...	..	...	...	...	...	...	...
Enteritis	5	...	..	...	...	...	...	...	...	1	..	...
Gastro En- teritis	2	1	...	...	...	...	...	...	...	..	...	...
Total	14	2	...	1	...	...	..	...	...	1	..	...

14 of the deaths occurred in infants under 1 year of age as follows:—

Under 4 weeks	...	...	...	3
4 weeks to 3 months	...	...	...	1
3 to 6 months ...	...	...	...	7
6 to 9 months	...	...	...	1
9 to 12 months	...	...	...	2
			—	14
			—	

PUBLIC HEALTH (VENEREAL DISEASES) REGULATIONS, 1916.

The scheme of the Council for diagnosis and treatment of venereal diseases consists of:—

1. The free provision to medical practitioners of facilities for obtaining pathological reports on blood and morbid products from patients infected, or suspected of infection, with venereal disease.

2. Provision of Salvarsan-substitutes free to such medical practitioners as have satisfied the Medical Officer of Health that they are qualified to receive them under Section (2) of L.G.B. Circular of 29/8/1916.
3. Conjointly with the County Council of Cumberland the establishment of a treatment centre at the Cumberland Infirmary, Carlisle (including the appointment of a Specialist Medical Officer).
4. Propaganda.

The development of the work during the year 1919 is conveniently considered under these four headings:—

1—PATHOLOGICAL EXAMINATIONS.

On the 1st August, 1918, an agreement was concluded with Professor H. R. Dean, Department of Pathology, Manchester University, to provide for reports on pathological examinations of blood and specimens in connection with the diagnosis and treatment of venereal diseases.

The following pathological examinations were made under this agreement during the year:—

	For Medical Practitioners.	For Treatment Centre.	
	From persons residing in City of Carlisle	From persons residing in City of Carlisle	From persons residing in other areas
Examinations of blood for Wassermann Reaction	16	112	<div> <div>Cumberland 6</div> <div>Westmorland 1</div> <div>Dumfriesshire 2</div> <div>Durham 1</div> </div>
Examinations for Spirochaeta Pallida ..	...	6	Cumberland 2
Examinations for Gonococci	1	17	<div>Cumberland 5</div> <div>Dumfriesshire 1</div>

2—PROVISION OF SALVARSAN-SUBSTITUTES.

The number of medical practitioners entitled to receive free supplies of Salvarsan-substitutes on application was 4 on 1st January, 1919. During the year 1919 the names of 2 other medical practitioners have been added to this list, making a total of 6.

Salvarsan-substitutes were supplied for treatment both at the Cumberland Infirmary and by private practitioners. The following particulars relate to the nature and quantity of Salvarsan-substitutes supplied during the year.

Nature of Substitute.	Quantity.	Number of Doses Supplied.	
		Cumberland Infirmary.	Medical Practitioners.
Galyl, intravenous	.30 Gram	...	1
do.	.35 „	166	8
do.	.40 „	152	37
Neokharsivan	.75 „	6	...

3—ESTABLISHMENT OF TREATMENT CENTRE.

The establishment of a Treatment Centre at the Infirmary is still the tedious subject of negotiation between the Infirmary Committee, the Authorities of the City of Carlisle and the County of Cumberland, and the Ministry of Health.

From 1st January, 1919, to 3rd September, 1919, a venereal diseases clinic was held at the Cumberland Infirmary by members of the Infirmary staff, and on the 10th September Dr. A. E. Quine, the newly-appointed Medical Officer for this work, took over the clinics.

Return relating to all persons *resident in the City of Carlisle* who were treated at the Treatment Centre at the Cumberland Infirmary during the year ended the 31st December, 1919.

	Syphilis.		Gonorrhœa.		Conditions other than Venereal.		Total.	
	M	F	M	F	M	F	M	F
1. Number of persons who, on the 1st Jan., 1919, were under treatment or observation for	3	7	...	...	...	...	3	7
2. Number of persons dealt with during the year at or in connection with the out-patients' Clinic for the first time and found to be suffering from	30	12	18	8	13	8	61	28
Total—Items 1 and 2	33	19	18	8	13	8	64	35
3. Number of persons who ceased to attend the out-patient Clinic								
(a) before completing a course of treatment for	8	3	5	1	...	...	13	4
(b) after completion of a course of treatment, but before final tests as to cure of	6	5	4	2	...	..	10	7
4. Number of persons transferred to other Treatment Centres after treatment for	4	1	...	2	...	...	4	3
5. Number of persons discharged from the out-patient Clinic after completion of treatment and observation for	...	...	...	...	12	8	12	8
6. Number of persons who, on the 1st Jan., 1920, were under treatment or observation for	15	10	9	3	1	..	25	13
Total—Items 3, 4, 5 & 6	33	19	18	8	13	8	64	35

7. Total attendances of all persons at the out-patient Clinic :—490.

8. Number of doses of Salvarsan-substitute administered in out-patient Clinic :—275.

4—PROPAGANDA.

In March a series of lectures to parents and teachers was organised by the Carlisle Branch of the National Council of Women, the cost of which was paid by the City Council.

The full development of the Council's scheme still awaits the completion of the agreement for beds at the Cumberland Infirmary, and until such an agreement is made it is not practicable to enlist the full co-operation of the medical profession and the various other agencies in the City, nor to judge to what extent patients are ready to avail themselves of the facilities provided.

Facilities for irrigation in the case of persons suffering from gonorrhœa during the intervals between the Clinics were not available during the year 1919, but steps have now been taken to provide for daily irrigation in these cases. Facilities for disinfection (Prophylaxis) by persons who have been exposed to the risk of infection have not been provided, and such provision is not contemplated in the Council's scheme.

Report of the Veterinary Inspector.

218 newly-purchased cows were examined in the several byres of the City, amongst which the following conditions were found:—

Diseases of the Udder	...	...	5
Ulceration of Bowels	...	...	1
Enlarged Glands in the Throat	...	...	1
			<hr/>
			7
			<hr/>

These seven animals were returned to the sellers.

The bovine animals exposed for sale at the Sands Cattle Market, and also at the Auction Marts, were examined, a total of 43,510 such examinations being made.

The Auction Marts were visited each Monday in the year, and 5,163 pigs were examined.

10 carcases of beef, 4 carcases of mutton, and 3 carcases of pork were examined at the Public Abattoir, all of which I found to be unfit for human food.

4,090 examinations of milk cows were made in the several byres of the City during the year, in order to ascertain the presence or absence of disease likely to affect the milk supply, in the course of which the following conditions were found:—

Gastric Derangement	...	...	...	7
Septicæmia	...	...	...	5
Milk Fever	...	...	...	3
Chill	...	...	...	3
Acute Pulmonary Tuberculosis	...	...	...	2
Inflammation of Udder	...	...	...	2
Red Water	...	...	...	1
Disease of Liver	...	...	...	1
Generalised Tuberculosis	...	...	...	1
Pneumonia	...	...	...	1
				—
				26
				—

Two of the animals were suffering from Acute Pulmonary Tuberculosis and another from Generalised Tuberculosis. I advised the owners in each instance that the animals should be slaughtered, to which they agreed. One cow suffering from septicæmia and another from red water died. The milk of the other 21 animals was destroyed until convalescence was established.

The Corporation horses, 20 in number (including one used by the Committee of the Burial Board), have been under close observation during the year; with one exception the animals were free from serious illness. The animal in question was found dead in the stable; a post-mortem examination showed that death was due to internal hæmorrhage from a ruptured blood vessel.

I had notice that certain sheep within the City were suspected to be affected with scab. On examination I found 6 sheep affected with this disease. I took scrapings of the skin for microscopical examination and demonstrated the acari. The necessary administrative orders were carried out, the animals isolated and treated, and kept under observation until cured and free from infection.

I received reports that 5 horses were suspected to be suffering from parasitic mange. I took scrapings, and on microscopical examination found 4 to be affected with psoroptic mange, the other being negative. The administrative orders were carried out, the four affected animals were isolated and treated, and kept under observation until they were free from infection.

At the request of the Medical Officer of Health I visited two farms outside the City and examined 18 and 48 cows respectively. At the first farm one cow was found to be suffering from a catarrhal inflammation of the udder. A sample of milk was taken from this cow, and microscopical examination revealed the presence of pus and blood cells. In the second instance three cows were found to have defective udders. Samples of milk were taken from each and submitted for bacteriological examination, with the following results:—

Sample from Cow No. 9—Milk satisfactory.

Sample from Cow No. 16—Milk contained Leucocytes and Streptococci.

Sample from Cow No. 5—Milk contained Leucocytes and Streptococci.

The milk of the two latter animals was unfit for human consumption.

DRAINAGE AND SEWERAGE.

Every street in the old City is sewered. The original scheme was laid out by Mr. (afterwards Sir) Robert Rawlinson, and has been extended from time to time as required and brought up to date.

On the extension of the City boundaries in 1912 unsewered areas in Botcherby, Harraby, Upperby, Belle Vue, and Stanwix were added to the City. Since that date a sewer has been constructed in Botcherby and connected with the City sewers; a scheme is in hand and will shortly be carried out for the sewerage of Harraby, which will be connected with the system of City sewers. Schemes for the sewerage of Upperby and part of Belle Vue are being prepared and will be carried out as soon as practicable.

The whole of Stanwix, with the exception of two low-lying areas, viz., Eden Terrace and St. Martin's Lane, is sewered, the works for the disposal of this sewage being situated outside the district. The sewage from the higher part of Belle Vue passes under the River Eden and is also treated at the same works. The sewage from Eden Terrace and St. Martin's Lane will be forced by means of ejectors into the main Stanwix sewer.

The sewage of the City, as it stood before the extension of 1912, is treated at the new sewage disposal works in Willow Holme. The sewage is double screened and then lifted by electrically-driven centrifugal pumps into three continuous flow sedimentation tanks, having a total capacity of 1,500,000 gallons. After its passage through the sedimentation tanks the sewage flows through fixed jets and is delivered in the form of a fine spray upon the graduated filter beds. The beds are 6ft. deep and have a total cubic capacity of 42,370 cubic yards. Additional beds for stormwater, having a total cubic capacity of 16,000 cubic yards, are also available.

CLOSET ACCOMMODATION.

The whole of the old City is provided with water-closets, but in some parts of the added area privies are in use. In the added areas which were sewered most of the existing privies have been replaced by water-closets; this work, however, owing to a large extent to difficulty in obtaining materials and labour during and since the war, has been slow.

About 130 privies exist at the present time, which will be replaced by water-closets as soon as practicable.

SCAVENGING.

There are no cesspools in existence.

Portable receptacles for the collection of house refuse have been in use for the last 20 years. Ashpits in existence in the added areas have been closed and portable receptacles insisted upon, and house refuse is removed regularly from all premises in the City.

From business houses, courts, and lanes in the centre of the City refuse is collected daily between 7-30 and 9-30 a.m., and from the remaining portions of the old City three times weekly.

Refuse is collected twice weekly in Stanwix and once weekly in Upperby, Botcherby, Harraby, and Belle Vue.

The refuse is tipped into old clay pits or used to make up low-lying land near the river. The tips are covered with soil and no nuisance arises from this method of disposal.

There is a small one-celled refuse destructor in which offal from the slaughter-house and other refuse liable to cause a nuisance is incinerated.

WATER SUPPLY.

SOURCE.—The water is derived partly from springs and partly from streams forming the head waters of the River Gelt, a tributary of the Eden, which rises in an up-land valley on the western side of the Pennines, about 16 miles east of Carlisle. The gathering ground is about 7,500 acres in extent, and consists entirely of open moorland, there being no habitation within the collecting area.

The water from each spring is led by pipes to the main receiving chamber, situate at the junction of two streams, the old and the new water, which join to form the River Gelt. Weirs have been built across these streams, enabling water from them to be diverted through copper gauze screens into the receiving chambers. The spring water is always clear and bright, but in times of flood the streams may become turbid, and the receiving chamber is so arranged that during floods water from streams can be excluded.

From the receiving chamber the water is conducted through a 20-inch cast-iron main to the storage reservoir at Castle Carrock, 3 miles away, which has a capacity of 180 million gallons.

Adjoining the storage reservoir are seven filter beds covering an area of 5,250 square yards.

After filtration the water passes into a covered pure water tank, whence it flows through a 16-inch cast-iron main, 6 miles long, to the covered service reservoir at Cumwhinton, which has a capacity of 5 million gallons. From Cumwhinton the water is conveyed into the city through a 21-inch cast-iron main, $4\frac{1}{2}$ miles long.

During the past year samples of water were taken from a domestic tap and submitted to chemical and bacteriological examination, the quality of the water being uniformly good.

The chemical and bacteriological results of quarterly samples are given in the following pages, together with the results of a special examination as to the action of the water upon lead.

Reports on Samples of Water from Domestic Tap.

BACTERIOLOGICAL EXAMINATION BY

PROF. DELÉPINE, MANCHESTER.

QUANTITATIVE ANALYSIS	1919.							
	Number of colonies in one gramme of water.				No. of kinds clearly recognisable.			
A Aerobic micro-organisms growing for 3 days in nutrient gelatine at 20° C to 21° C.	APRIL.	JULY.	OCT	DEC.	APL.	JULY.	OCT.	DEC.
Non-Liquefying Bacteria ...	9 } 10	6 } 7	49 }	10 }	3 } 4	1 } 2	4 }	2 }
Liquefying Bacteria ...	1 }	1 }	10 }	7 }	1 }	1 }	5 }	4 }
Other Micro-Organisms ...	...	...			...	...
B Anaerobic Micro-Organisms ...	...	...	...	...	...	...	...	...

QUALITATIVE ANALYSIS.	1919.			
	APRIL.	JULY.	OCT.	DEC.
A Bacteria associated with sewage or faecal pollution ...	B. Coli communis not found in 100 C. C.	B. Coli communis not found in 100 C. C.	B. Coli communis not found in 100 C. C.	B. Coli communis found in 100 C. C. but not in 15 C.C.
B Bacteria associated with disease	Not found	Not found	Not found	Not found

In commenting on the results of the bacteriological examination of the sample of water taken in October, Professor Delépine stated: "This water is satisfactory from a bacteriological point of view."

In his remarks on the December sample he states: "This sample of water shows evidence of very slight pollution, which possibly is accidental."

CHEMICAL ANALYSIS BY DR. HELLON, WHITEHAVEN.

Results shown in grains per gallon.

1919.

CHEMICAL.	MARCH.	JUNE.	SEPT.
Total Solid Matter in solution dried at 212° Fahr. ...	7.280	8.400	7.560
Chlorine existing as Chlorides ...	.490	.525	.490
Ammonia	traces	traces	traces
Albuminoid Ammonia ...	.003	.002	.003
Nitrogen existing as Nitrates ...	traces	traces	traces
Oxygen absorbed in 15 minutes at 80° Fahr. ... ..	.034	.021	.058
Oxygen absorbed in 4 hours at 80° Fahr. ... ..	.069	.042	.106
Lead and other Poisonous Metals	None	None	None
Hardness before boiling ...	6°	6 $\frac{1}{4}$ °	5 $\frac{1}{2}$ °
Hardness after boiling ...	$\frac{1}{2}$ °	$\frac{3}{4}$ °	1 $\frac{1}{4}$ °
Appearance in two-foot tube ...	Clear greenish- yellow	Clear yellowish- green	Clear yellowish- green
Smell when heated to 100° Fahr....	None	None	None
Microscopical Examination ...	Slight deposit of Vegetable debris	Vegetable debris	Slight deposit of Vegetable debris

A determination of the plumbo-solvent action of the water was made according to the method of the Local Government Board in all samples taken during the year, with the following results :—

Lead dissolved at 3.5° C—

	1st	2nd	3rd	4th	5th	Average.
APRIL	50 c.c.	50 c.c.	50 c.c.	50 c.c.	50 c.c.	
	.04	.04	.04	.03	.02	.03

Lead dissolved at 15° C—

	1st	2nd	3rd	4th	5th	Average.
JULY	50 c.c.	50 c.c.	50 c.c.	50 c.c.	50 c.c.	
	.02	.04	.04	.04	.04	.04

Lead dissolved at 9° C—

	1st	2nd	3rd	4th	5th	Average.
OCT.	50 c.c.	50 c.c.	50 c.c.	50 c.c.	50 c.c.	
	.04	.04	.04	.04	.04	.04

Total annual distribution of Water from Cumwhinton covered reservoir during the years 1914 to 1919.

Year.	Number of Gallons.	No. of Gallons per head, per day.
1914	690,410,000	33.34
1915	710,974,000	34.03
1916	758,483,000	35.80
1917	801,490,000	33.78
1918	795,220,000	34.58
1919	804,040,000	34.88

RAINFALL.

Observations taken at the Carlisle Cemetery by J. T. Charlton, Esq.

MONTHS.	1919.										Average for 10 years 1909-1918.		
	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918			
												Rainfall.	Number of days on which Rain fell.
January	in. 1.69	in. 2.73	in. 1.04	in. 1.45	in. 2.17	in. 2.64	in. 3.17	in. 3.55	in. 1.53	in. 3.13	in. 2.88	24	in. 2.31
February	1.50	4.04	3.62	1.35	1.27	2.59	3.56	3.31	1.13	2.86	1.05	10	2.53
March	3.14	1.25	1.33	3.81	3.37	2.67	1.88	2.14	1.98	0.66	2.35	16	2.23
April	2.52	1.69	2.75	0.42	2.77	1.36	1.91	2.44	2.45	0.50	1.49	18	1.88
May	0.81	2.07	2.32	1.81	1.78	1.73	2.04	2.98	1.91	1.88	1.10	11	1.93
June	2.95	1.53	3.79	4.13	2.40	1.06	1.15	3.30	2.01	0.87	2.66	17	2.32
July	4.44	3.76	0.69	1.83	1.12	3.04	3.80	4.61	1.31	3.73	0.87	8	2.83
August	3.68	4.28	2.20	4.47	2.17	2.73	3.27	2.39	5.64	3.21	2.96	16	3.40
September	2.50	0.38	2.16	2.22	2.11	1.28	1.03	2.06	2.61	7.36	1.81	15	2.37
October	5.22	1.68	2.23	2.10	2.51	1.11	1.25	5.10	4.33	4.00	2.36	12	2.95
November	0.86	3.61	3.34	2.65	3.40	4.52	0.58	4.34	2.83	2.01	2.36	19	2.82
December	3.82	2.62	4.73	3.73	2.46	3.58	4.64	2.75	1.40	3.44	3.32	25	3.32
Totals ...	33.13	29.64	30.20	30.01	27.53	28.31	28.28	38.97	29.13	33.65	25.21	191	30.89
Total number of days on which Rain fell	162	197	181	217	194	201	183	228	176	190	...	...	193

Observations by W. Eggleston, Esq., upon the rainfall at Denton Holme Allotment Gardens, taken weekly with a gauge of 5 inches 2 feet above the ground level, and 57 feet above sea level, show that during the year 23.44 inches of rain fell, giving a weekly average of 0.45 inches. There were two weeks without rain, one in February and one in June. The driest month of the year was February, with a rainfall of 0.98 inches, the wettest being August, with a rainfall of 2.92 inches.

Evaporation gauged from an open vessel 2 feet above the ground level during the year was 31.42 inches, the greatest evaporation taking place during the month of July, viz., 5.91 inches; the lowest during the month of December, viz., 0.44 inches.

HOUSING.

I—GENERAL HOUSING CONDITIONS IN THE DISTRICT.

(1) Number of houses	...	...	...	11,892
Number of houses for the working-classes				7,734
Number of houses erected during the year or in course of erection	...	...	...	56
(2) Population	...	...	...	53,000

There has been no change in the population during the past year, nor is any change anticipated in the future.

(3) (a) The shortage of houses is estimated at 600, which are required to meet the unsatisfied demand for houses, due to the natural growth of the population.

(b) A programme for building 600 houses as quickly as possible to meet this demand has been commenced. There is also a scheme under consideration for providing a further supply of houses for the accommodation of families who will be displaced during the re-modelling or any other improvement of slum areas.

II—OVERCROWDING.

(1) The number of tenements with more than two occupants per room, according to the census of 1911, was 1,148, the total number of occupiers in these tenements being 8,107.

(2) This overcrowding is to a great extent due to the natural increase of the population, combined with the lack of building enterprise since 1906. Since that year only 189 dwelling houses have been erected in the City of Carlisle. Between the years 1911 and 1914 a large number of houses which were either unfit for human habitation or were obstructive buildings were demolished, and this action has added to a certain extent to the overcrowding in the City.

(3) The overcrowding will be dealt with, firstly, by the building of new houses, and secondly, by the re-modelling and enlarging of the existing small tenement dwellings.

(4) No action has been taken with regard to overcrowding during the past year, as it is impossible, until new houses are built, to displace families from their present dwellings.

III—FITNESS OF HOUSES.

(1) (a) The general standard of housing in the district is good, except in certain limited slum areas, with which it is proposed to deal as soon as possible.

(b) Apart from houses which cannot be made habitable owing to the serious sanitary defects, the defects found are minor dilapidations, &c., due to the usual wear and tear and the lack of normal repairs during the period of the war. These minor defects are being dealt with under the Public Health Act.

(2) (a) Information as to the action taken as regards unfit houses under the Public Health Acts is contained in the report of the Sanitary Inspector on page 106.

(b) No action under the Housing, Town-planning, &c., Act, has been taken during the year, owing to the absence of members of the sanitary staff on active service, and also to the lack of accommodation for families who would have been displaced by action under this Act.

(3) Difficulty has been experienced in remedying more serious defects found in houses, owing to the impossibility of the tenants being able to vacate the houses while defects were remedied. Scarcity of materials and the difficulty of obtaining labour, which has been felt all over the country, has also been responsible for the tardiness of this work in Carlisle.

(4) Information with regard to the water supply, closet accommodation, and refuse disposal has been given on pages 85—89.

IV—UNHEALTHY AREAS.

(1) No areas were being dealt with under Part 1 and Part 2 at the beginning of the year, and consequently no action has been taken under these parts of the Housing Act of 1890.

(2) No areas were represented during the year, and no complaints that areas were unhealthy have been received during the year.

There are no bye-laws in force in the City relating to houses let in lodgings, or to tents, vans, sheds, &c.

The subjoined table gives particulars relating to certain houses dealt with during 1913, 1914, and 1916, in connection with which certain matters require to be done.

Number of Situation.	Date represented to Committee.	Date of Closing Order Served under Housing, Town Planning, &c., Act, 1909	Date of Demolition Order served under Housing, Town Planning, &c., Act, 1909	Remarks.
1, 2, 3, 4, 5, 6, 7, & 9 Barley Stack Lane	21st Nov. 1913	9th Dec., 1913	10th June, 1914	Part of the property demolished, the other part still standing
12, 14, 16, 18, 22, 26, & 28 Chapel Street	19th June, 1914	15th July, 1914	14th Sept., 1915	<i>In statu quo</i>
5 houses in Donald's Court, Willow Holme	19th June, 1914	15th July, 1914	14th Sept., 1915	Do.
3 houses, Willow Holme	19th June, 1914	15th July, 1914	14th Sept., 1915	Do.
1 & 2 Wood Street, Botcherby	28th Jan., 1916	9th Feb., 1916	...	Demolished

Table showing number of dwelling houses erected in the City from 1891 to 1919, inclusive.

No. of Houses			No. of Houses		
Year.		erected.	Year.		erected.
1891	...	149	1906	...	183
1892	...	81	1907	...	42
1893	...	148	1908	...	27
1894	...	184	1909	...	7
1895	...	176	1910	...	23
1896	...	198	1911	...	11
1897	...	217	1912	...	11
1898	...	208	1913	...	18
1899	...	226	1914	...	38
1900	...	262	1915	...	9
1901	...	181	1916	...	1
1902	...	178	1917	...	2
1903	...	170	1918	...	0
1904	...	269	1919	...	2
1905	...	181			

PUBLIC BATHS.

NUMBER OF BATHERS DURING 1919.

The total number of bathers was 87,197, as compared with 75,309 in 1918 and 80,455 in 1917.

SWIMMING BATHS.					1st Class.	2nd Class.	Total.
Adults (both sexes)	...	...	...	...	10,546	20,617	31,163
Elementary School Children (Free)	...	...	...	...	...	13,972	13,972
Boys' Brigade, &c. (swimmers charged 1d. each)	...	...	...	...	...	3,324	3,324
Club and Contract Bathers	...	...	...	...	...	1,430	1,430
PRIVATE BATHS.							
Adults (both sexes)	...	...	...	...	13,393	21,651	35,044
Vapour	...	...	...	...	...	...	209
Salt	...	...	...	...	1	1	2
TURKISH BATHS.							
Males	...	...	...	...	507	833	1,340
Females	...	...	...	...	102	611	713
Total					...	...	87,197

PUBLIC SLAUGHTER-HOUSES.

The following Table gives particulars of Animals killed, Carcases examined, and particulars of Carcases unfit for human food.

Animal	Total number of animals slaughtered and examined	Number of carcases specially referred for examination	Number in which the whole carcase was unfit for human food	Number in which a portion of a carcase was unfit for human food	Number affected with Tuberculosis.	
					Whole carcase condemned	Part of carcase condemned
Oxen	3,054	125	88	30	55	16
Sheep	57,885	167	137	29	1	...
Calves	815	17	16	1	3	...
Pigs	2,451	5	4	...	...	...
<i>Imported</i> Oxen	...	1	...	1	...	...
Sheep	...	19	18	1	...	...
Totals	64,205	334	263	62	59	16

I have the honour to be,

Your obedient Servant,

JOSEPH BEARD.

Public Health Department,
19 Fisher Street, Carlisle.

May, 1920.

Chief Inspector's Annual Report.

TO THE CHAIRMAN AND MEMBERS OF THE HEALTH COMMITTEE.

I have the honour of presenting my Annual Report for the year 1919.

BAKEHOUSES.

There are 52 bakehouses upon the register, 3 of which are underground bakehouses.

DAIRIES, COWSHEDS, AND MILKSHOPS.

There are 35 registered cow-keepers and milk-sellers upon the register.

COMMON LODGING-HOUSES.

There are 2 licensed common lodging-houses within the City.

FRIED FISH AND POTATO SHOPS.

There are 24 fried fish and potato shops on the register.

ICE-CREAM SHOPS.

There are 7 ice-cream shops in the City.

OFFENSIVE TRADES.

There are 5 premises where offensive trades are carried on, viz., 1 gut scraper and 2 tripe dressers, 1 tanner and 1 fellmonger.

VANS, USED AS DWELLINGS.

All the vans entering the City to attend fairs, &c., have been inspected, in order to ascertain their sanitary condition. They were all found to be satisfactory.

PUBLIC MARKETS.

The Public Markets and premises where food is prepared or exposed for sale have been inspected, and the necessity for the observance of careful hygienic measures pointed out.

SHOPS.

There are 769 shops upon the register all of which, except grocery shops, are regulated as to closing hours by Closing Orders. There is no Closing Order in operation for grocery shops, but the majority of the larger establishments close at the same times as those shops which are regulated by Closing Orders.

DISEASED AND UNSOUND FOOD.

The following table shows the amount of food seized or surrendered as being unfit for human consumption :—

Nature of Food Condemned.					Quantity.
Beef ...	...	...	...	...	46,648 lbs.
Mutton	...	...	...	...	8,018 „
Pork	...	...	...	...	402 „
Veal	...	...	...	...	957 „
Condensed Milk	...	...	...	...	9 tins.
Bacon	...	...	...	...	19 lbs.
Tinned Beef, Tongue, Salmon, &c.	...	...	...	...	107 „
Cheese	...	...	...	...	6 „
Tinned Pears, Tomatoes, &c.	...	...	...	...	7 tins.
Rabbits	...	...	...	...	32
Dates	...	...	...	...	27 boxes.
Pears	..	...	...	...	30 barrels.

PUBLIC ABATTOIR.

Frequent visits have been paid to the Public Abattoir and the following tables give the number of animals killed during the years 1917, 1918, and 1919 :—

Year.	Beasts.	Sheep and Lambs.	Calves.	Pigs.	Total.
1917	4,166	15,609	248	3,334	23,357
1918	3,257	53,357	235	1,894	58,743
1919	3,054	57,885	815	2,451	64,205

It will be observed that there has been a great increase in the total number of animals slaughtered at the Public Abattoir during the years 1918 and 1919 as compared with 1917, which was a normal year. The increase is due to the operations of the Ministry of Food in closing up the Railway Slaughter-houses, and concentrating the whole of the slaughtering at the Public Abattoir.

The quantity of food destroyed, particularly beef, mutton, and veal, is also much in excess of the quantity destroyed under normal conditions of slaughtering, and is due to the Regulations of the Ministry of Food requiring casualty carcasses slaughtered on farms to be sent to the Public Abattoir for inspection.

RAG FLOCK ACT, 1911.

The Rag Flock Regulations, 1912.

During the year the premises of all firms engaged in the manufacture or sale of furniture, bedding, &c., in which rag flock is used or sold, were visited for the purpose of obtaining samples of rag flock for analysis under the above act and regulations. In only two instances, however, were firms found to be in possession of rag flock for sale or use in the manufacture of bedding or upholstery, &c. Two samples were obtained for analysis, both of which complied with the standard of cleanliness laid down by the above regulations.

Sample.			Soluble Chlorine parts per 100,000.
No. 1.	...	...	... 25.0
No. 2.	...	...	... 26.0

FOOD AND DRUGS.

During the year the articles set out in the following table have been purchased and submitted to the Public Analyst for analysis:—

The following table shows the number of articles purchased, result of analysis, and action taken.

Article.	No. of Samples taken.	Genuine.	Adulterated.	Extent and Form of Adulteration.	Remarks.
Coffee ...	25	25	...	...	...
Lard ...	23	23	...	...	...
Baking Powder	27	27	...	...	...
Self-raising Flour	13	13	...	..	...
Salad Oil	3	3		...	...
Milk ...	39	36	3	Deficient in non-fatty solids to the extent of— (a) 0·45 per cent. (b) 0·48 per cent. Deficient in butter fat to the extent of— (a) 1·16 per cent.	Vendor prosecuted. Case dismissed. In this case an “appeal to the cow” samp’le was taken. when it was found to be a genuine milk of good quality. The Committee ordered proceedings to be taken, but the vendor, who had been ill for some considerable time, died before the case could be proceeded with.
Number of Samples taken...	130				
Genuine ...		127			
Adulterated			3		

PUBLIC HEALTH (MILK AND CREAM) REGULATIONS, 1912.

Analytical Report for the year ending 31st December, 1919:—

1. Milk; and cream not sold as preserved cream.

—	(a) Number of samples examined for the presence of a preservative.	(b) Number in which a preservative was reported to be present.
Milk	37	...
Cream ... ..	...	...

Nature of preservative in each case in column (b), and action taken under the Regulations in regard to it.

2. Cream sold as preserved cream.

(a) Instances in which samples have been submitted for analysis to ascertain if the statements on the label as to preservatives were correct.

(i) Correct statements made	} Nil
(ii) Statements incorrect	

(b) Determinations made of milk fat in cream sold as preserved cream.

(i) Above 35 per cent.	} Nil
(ii) Below 35 per cent.	

(c) Instances where (apart from analysis) the requirements as to labelling or declaration of preserved cream in Article V. (1) and the proviso in Article V. (2) of the Regulations have not been observed Nil

No samples of cream were submitted for analysis during the year. The restrictions on the sale of cream under the Defence of the Realm Act were revoked only for a period of four months, and during that time there was practically no demand for the article. Any that was on sale was produced on local farms, and no preservatives were used.

FACTORY AND WORKSHOP ACTS.

There are 224 workshops upon the register, excluding bakehouses.

OUT-WORKERS.

5 lists of out-workers have been received, as required by the home-work provisions of the Factory and Workshop Act, 1901.

In each instance the premises were visited and found to be in a satisfactory condition.

Factories, Workshops, Workplaces, and Homework.

1.—Inspection of Factories, Workshops, & Workplaces.

INCLUDING INSPECTIONS MADE BY SANITARY INSPECTORS OR INSPECTORS OF NUISANCES.

Premises.	Number of		
	Inspections.	Written Notices.	Prosecutions.
FACTORIES (Including Factory Laundries)	75	...	...
WORKSHOPS (Including Workshop Laundries)	277	9	...
WORKPLACES (Other than Outworkers' premises included in Part 3 of this Report)	...	..	...
TOTAL	352	9	...

3.—Home Work.

NATURE OF WORK.	OUTWORKERS' LISTS, SECTION 107.					
	Lists received from Employers.					
	Sending twice in the year.			Sending once in the year.		
	Lists.	Outworkers.		Lists.	Outworkers.	
		Con-tractors.	Work-men.		Con-tractors.	Work-men.
Wearing apparel— Making, &c. ...	4	...	4	1	...	1
Cleaning and Washing ...	...	...	...	...	...	..
Total ...	4	...	4	1	...	1

2.—Defects found in Factories, Workshops, and Workplaces.

Particulars.	Number of Defects.			Number of Pro-secutions.
	Found.	Remedied.	Referred to H. M. Inspector.	
<i>Nuisances under the Public Health Acts :—</i>				
Want of cleanliness	23	23	...	...
Want of ventilation ... ..	...	...	...	..
Overcrowding... ..	...	...	...	...
Want of drainage of floors ...	...	...	...	...
Other nuisances ... ..	..	..	...	...
<i>Sanitary accommodation :—</i>				
{ Insufficient	1	1	...	...
{ Unsuitable or defective	3	2	...	...
{ Not separate for sexes	...	...	...	...
<i>Offences under the Factory and Workshop Acts :—</i>				
Illegal occupation of under-ground bakehouse (s. 101)...	...	..	...	..
Breach of special sanitary requirements for bakehouses (ss. 97 to 100) ... ..	...	...	...	...
Other offences (Excluding offences relating to outwork, which are included in Part 3 of this report)	1	...	...	...
Total	28	26	None	None

4.—Registered Workshops.

Workshops on the Register (s. 131) at the end of the year			Number.
Important classes of workshops, such as workshop bakehouses, may be enumerated here.	Workshops		186
	Domestic Workshops ...		38
	Bakehouses		52
	Total number of workshops on Register ...		276

5.—Other Matters.

Class.	Number.
Matters notified to H.M. Inspector of Factories :—	
Failure to affix Abstract of the Factory and Workshop Acts (s. 133, 1901)	3
Action taken in matters referred by H.M. Inspector as remediable under the Public Health Acts, but not under the Factory & Workshop Acts (s. 5, 1901) :	
Notified by H.M. Inspector	11
Reports (of action taken) sent to H.M. Inspector	10
Other ... ..	...
Underground Bakehouses (s. 101) :—	
In use at the end of the year	3

HOUSE REFUSE REMOVAL.

15,811 loads of refuse have been collected and removed to the refuse tips and destructor, an increase on the year 1918 of 1,159 loads.

GARBAGE.

680 loads of garbage have been removed from the Public Slaughter-houses, as compared with 511 in 1918.

INFECTIOUS DISEASES.

200 cases of infectious diseases have been investigated by the Inspectorial Staff, and 98 cases were removed to hospital for isolation.

DISINFECTION.

All the houses from which cases of infectious disease were removed to hospital, and rooms in which cases were isolated at home, were either sprayed with formaldehyde or cleansed under the supervision of your inspectors, and the disinfection of bedding, clothing, &c., used, or which had been in contact with infected persons, is set out in the following table:—

Mattresses and Beds	...	...	175
Bolsters and Pillows	...	...	348
Blankets	...	...	380
Quilts	...	...	141
Carpets and Rugs	...	...	52
Miscellaneous Articles	...	...	247
Kits, Army and Navy	...	...	27
Total			1370

HORSES.

The number of horses under my charge at the Dépôt, Boustead's Grassing, is 19. 12 of these are engaged in house refuse removal, 6 are used for street cleansing purposes, and 1 is kept as a relief horse.

Remedial Works.

Houses disinfected	-	-	-	-	-	117
Schools disinfected	-	-	-	-	-	3
Articles disinfected	-	-	-	-	-	1370
Over-crowding abated	-	-	-	-	-	10
Walls, damp and defective, remedied	-	-	-	-	-	6
Roofs, guttering, spouting repaired	-	-	-	-	-	50
Yar 's paved	-	-	-	-	-	14
Abatement of nuisances caused by keeping of birds & animals						33
Water-closets repaired	-	-	-	-	-	27
Flushing apparatus repaired	-	-	-	-	-	26
Privies abolished and water-closets substituted in lieu thereof						4
Drains reconstructed	-	-	-	-	-	71
„ tested	-	-	-	-	-	37
Accumulations of manure removed	-	-	-	-	-	21
Workshops cleansed or limewashed	-	-	-	-	-	9
Bakehouses	„	„	-	-	-	14

Summary of Sanitary Work Performed in connection with Inspection of District.

Inspections.	Number of visits paid.
HOUSES—	
Houses inspected in accordance with the regulation of the H. & T. P. Act, 1909 ...	...
„ „ on complaint ...	169
Visits <i>re</i> Infectious Diseases ...	412
Common Lodging-houses inspected ...	50
Common Yards, Courts, & Alleys inspected ...	9353
Schools inspected ..	41
Temporary or movable dwellings inspected ...	71
TRADE PREMISES—	
Bakehouses ...	262
Laundries ...	11
Stables ...	103
Cowsheds { ...	201
Milkshops }	
Ice-Cream Shops ...	31
Fried Fish Shops ...	309
Food Manufactories ...	139
Slaughter-houses ...	118
Markets ...	153
Other Factories ...	75
„ Workshops and Workplaces ...	277
Chimneys observed (smoke nuisances) ...	25
Visits after serving notices to supervise works in progress ...	319
Refuse Tips ...	81
Shops Act Inspections ...	877
Visits in connection with various Food Orders	Numerous
Water samples taken for analysis ...	8
Miscellaneous inspections ...	150
<hr/>	
Notices served to abate Nuisances ..	330
„ complied with ...	320
„ not complied with ..	10

I have the honour to be,

Your obedient Servant,

C. W. HILL.

